commodore power play

December/January 1984-85
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GAME REVIEWS:

Satan's Hollow • Solar Fox
Triad • In The Chips • Wizard
Summer Games • Juice

TIPS ON THE NEW COMMODORE 16

CHRISTMAS BUYER'S GUIDE

GAMES FOR THE 64

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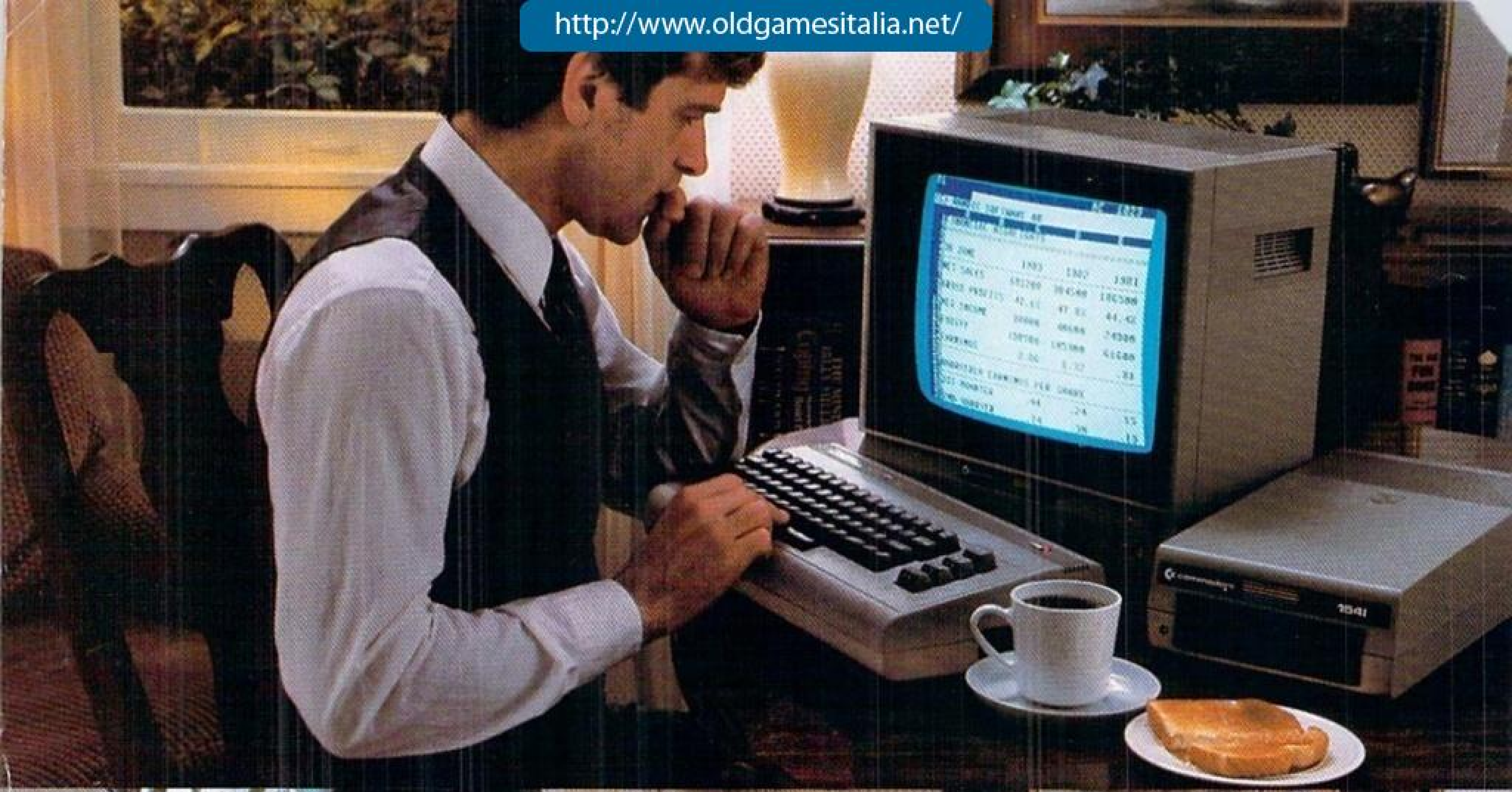
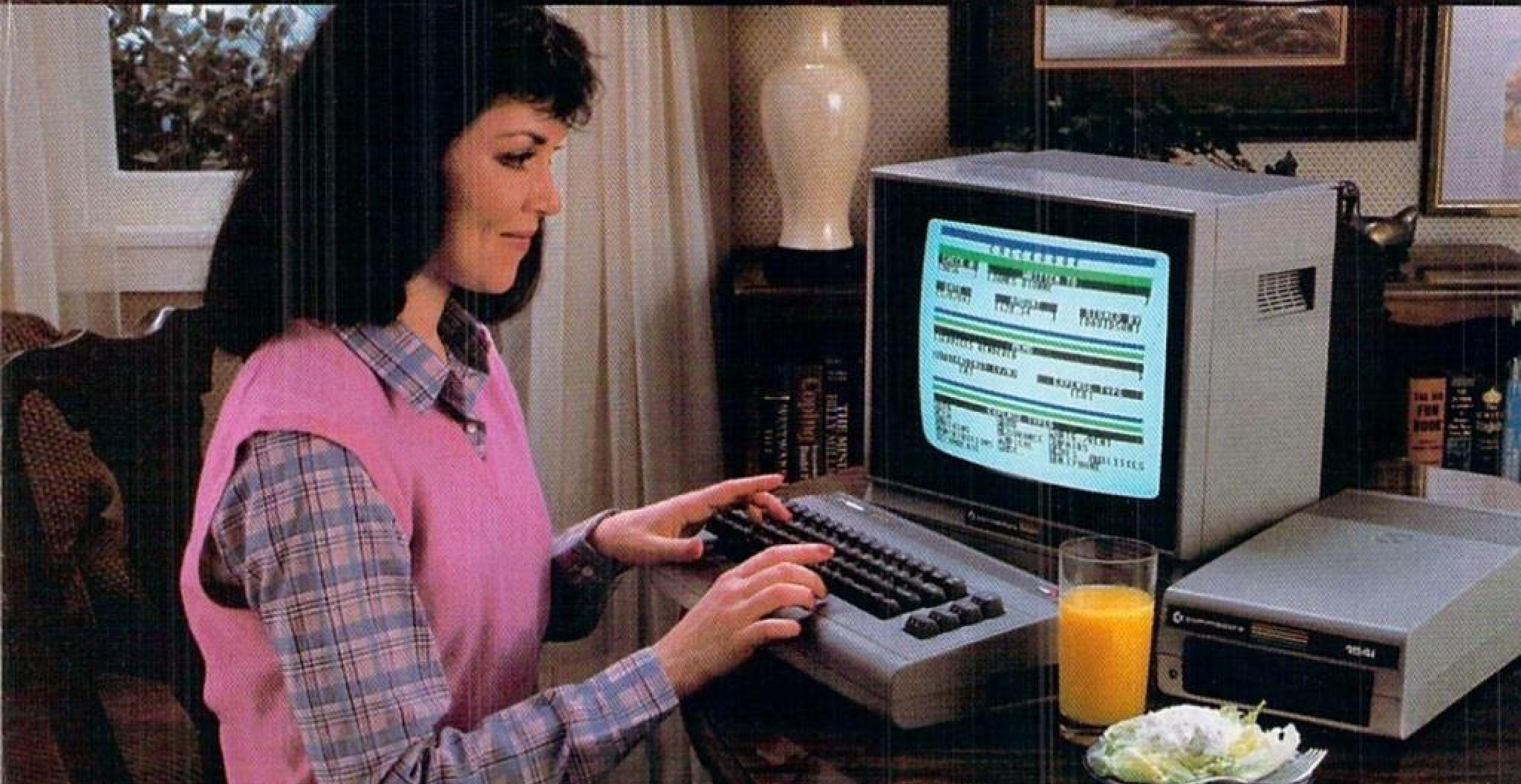
Which Stick is Best for You?





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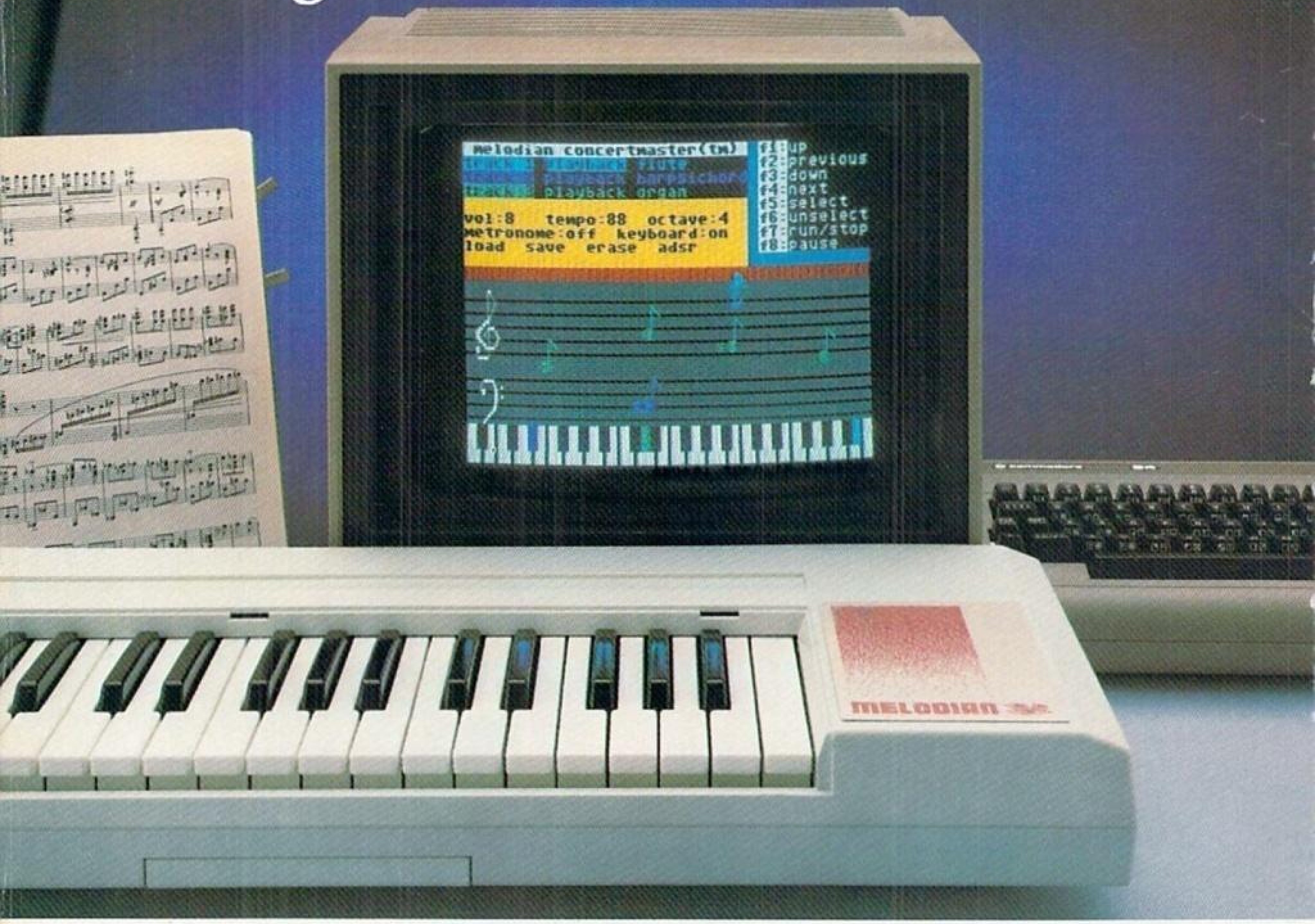
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LETTERS

To the Editor:

If you use a disk drive, there's an easy way to load and run programs.

If you use the DOS, type @$ and you will get the disk catalog. Now, change the color of your cursor, using CTRL (on the Commodore 64, CTRL and/or C=) followed by a number from one to eight. Now cursor up to the program you want and type RETURN to run or '/' to load. Any messages you now get (LOADING, READY, FILE NOT FOUND) will be in the new color and will be much easier to read.

If you don't use DOS, then type LOAD"$",8 and hit RETURN, then LIST when you see READY to get the disk catalog. Now change the color of the cursor (mentioned above). Cursor up to the program you want, type LOAD, move the cursor past the quote after the program name, type 8: and hit RETURN. Now, messages will be easier to read.

Thomas F. Trocco
Bronx, New York

To the Editor:

Readers of Dean S. Rossa's article "Traffic in the Fast Lanes" (Issue 10, page 73) may encounter difficulties if they try to save the program after first running it. The reason is that, if the statement POKE S,32 in line 240 is executed before lines 210 or 220 (as is quite probable), the result will be to POKE 0,32, thereby disabling SAVE (location 0 should contain 47).

This is doubly unfortunate inasmuch as POKE S,32 is not necessary; since S is always in the top row, scrolling alone will accomplish the desired effect.

Quite apart from this minor bug, the program as it stands lends itself to substantial simplification, but rather than engage in a line by line exegesis, I call your attention instead to the following totally revised version (for Commodore 64 only):

```
 10 PRINT"[CLEAR][WHITE]":A=1024:B=54312:G=160:H=158:K=RND(-TI)
    :T$="000000":POKE 214,9:PRINT
 20 PRINT "MOVEMENT KEYS: D TO GO RIGHT":PRINT TAB(15) "S TO GO LEFT"
 30 INPUT "[DOWN]TRACK WIDTH, BETWEEN 5 & 15";W:IF W<5 OR W>15
    THEN W=10
 40 T=INT(19-W/2):C=A+T+4:L=A+T+1:R=A+T+W:U=W-1
 50 PRINT "[CLEAR]":POKE 214,23:PRINT:FOR I=1 TO 25:PRINT TAB(T)
    "[CMDR M]"SPC(W)"[CMDR G]":NEXT:TI$=T$
 60 X=INT(RND(1)*W):GET K$:IF K$="" GOTO90
 70 IF K$="S" THEN C=C-1:IF C<L THEN C=L
 80 IF K$="D" THEN C=C+1:IF C>R THEN C=R
 90 PRINT TAB(T)"[CMDR M]"SPC(X)"^"SPC(U-X);:POKE C+B,1
100 IF PEEK(C+40)-32 THEN PRINT TI$:POKE C,H:FOR K=1 TO 1000:NEXT
    :TI$=T$:GOTO 60
110 PRINT "[CMDR G]":POKE C,G:GOTO 60
```

A guiding principle here is never to execute the same computation more than necessary; if it can be done in the initialization, keep it out of the main loop. As a result, execution is much faster, possibly too fast for some tastes, in which case a delay loop may easily be inserted.

Note the following modifications beyond mere simplification:

1) The introductory text appears in the middle of the screen.
2) The movement keys are S for go-left and D for go-right; students of Latin will appreciate the aptness of this choice. (Apropos of movement keys, there is something amiss in line 120 of Rossa's program.)
3) The track is centered on the screen regardless of the width chosen.
4) The characters for the car and obstacles are indifferent to the state of affairs in memory location 53272; besides, the arrows as obstacles streaming upward make for a more impressive effect.
5) In the event of a collision, the arrow embeds itself in the car.

John Auer
Willow Street, Pennsylvania

To the Editor:

While using my Commodore *Magic Desk I* program, my joystick broke, leaving me temporarily at a loss. I noticed that certain key combinations would give me the same results as the joystick in port two. I thought your readers might be interested in these combinations.

To move the finger:

	Port 2	Port 1
Right	—Control and G	2
Left	—Control and D	Control
Down	—Control and A	
Up	—Control and Cursor ↑/1	1
Activate	—RUN/STOP and N or Control and J (same as fire button)	Space Bar

Curtis A. Smith
Markham, Illinois

Editor's Note: This will work with most programs using a joystick.

To the Editor:

I have discovered a glitch in Reston Software's version of *Miner 2049'er* for the 64. If you hold down your fire button for a total of five seconds, you will advance to the next level without losing any men. I read in the August/September 1984 issue of *Power/Play* in an article by Neil Harris that since the game wasn't programmed to allow him to skip a level, he wouldn't be able to see all ten levels.

Tanya Mohlin
Tempe, Arizona

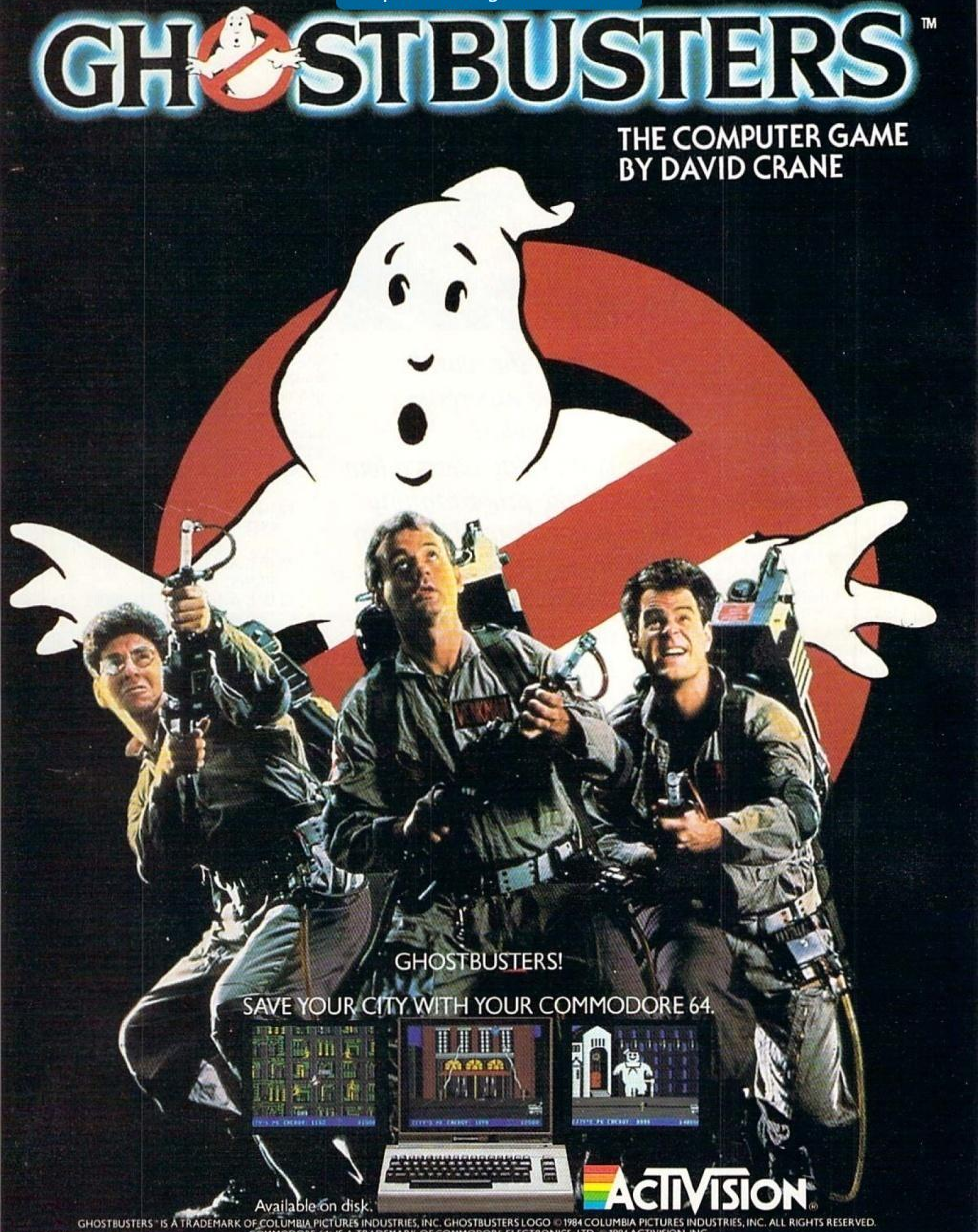
To the Editor:

A number of us neophyte computer users would appreciate it if one of your magazines would address the subject of the proper sequence for turning on and off the computer and various peripherals such as the 1541 disk drive, the 1701 monitor and a printer, such as an Epson or Gemini connected to the Commodore 64 via a Centronics parallel interface.

The 1541 manual says to turn on peripherals first and the computer last. I believe that the monitor manual says the same thing. The manual with the Cardco/?+G interface says to turn on the printer, the computer and other peripherals in that order. *Compute's Gazette* indicated that the computer should be turned on before the disk drive. In light of all of this conflicting information, it would be nice to have an expert address the subject in such a manner to eliminate the confusion. I'm not so much concerned about what order I do things, but I am worried about the damage that I might cause by doing something wrong.

Albert W. Leary
Creve Coeur, Missouri

Our resident expert says the disk drive and printer should be turned on before you turn on the computer. You can turn the monitor on at any time. However, be assured that if you do turn things on in the wrong order, you don't risk damaging your equipment. The worst that can happen is that the computer may not recognize that the peripheral is there. In which case you simply have to turn off the computer and turn it back on again. **C**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BY JIM BUTTERFIELD

Notes Toward Creating Better Programs Part 1

Think Before You Program

Plan your programs before you sit down at the computer. Think in advance about:

The SECTIONS of the program: initialization, input, processing, output, etc. You might like to "sketch out" the flow of the program. Don't bother with flowcharts except to work out local detail.

The VALUES the program will handle: Where will you keep these values? In variables? In arrays? In strings? Which values are one-of-a-kind? Which change as the program runs? Which variables can you group together?

The INPUT to the program: Where does the data come from? From data statements, which give semi-permanent values? From INPUT commands, asking the user to supply the variables at run time? From files, handling data generated during previous computer runs? How will you deal with possible input errors?

The OUTPUT: Will it appear on a screen or printer, or will it go to a file? How should it appear? Will it need titling, page numbers? Will numbers or data need to appear in columns? How can you present information most usefully to the user?

The USER of the program: experienced or naive? How can you be helpful to the user?

The FUTURE of the program: Will it be a one-shot program? Run occasionally? Regularly? Will it need to run on different models of machine? Will it need to be kept up to date?

The ACCURACY of the program: Do you have a test plan to make sure that the program really does what you hope it will do?

Give some thought to the above. Make a plan. Sketch out a little code.

One of the world's leading experts in Commodore computing offers a few simple programming suggestions. Use them to create better, more flexible programs that do exactly what you want them to—or close to it.

Then go to the computer.

If things don't go as hoped, don't be afraid to start over. The planning will go better on the second iteration. *Do not* try to patch up a bad plan.

You may use a variable—or even an expression—in most places that you can use a numeric value. Major exception: a line number (as in GOSUB or GOTO) must be numeric.

Instead of FOR J=1 TO 15, you may also code FOR J=X TO Y. Using variables, your loop can have its size set by the program instead of being fixed in advance.

PRINT#2 can become PRINT#D so you can set the output device for this piece of data just by setting the value of variable D.

Flexibility comes from introducing variables. Suppose we have a table of ten cities and wish to print a table of distances. We could code: FOR J=1 TO 10, FOR K=1 TO J. This uses variables more creatively.

Every time you write a number, think, "Would a variable make my program more general?" Every year has 12 months (fixed value OK); not every class has 30 students (variable recommended).

Boolean Values

You're allowed to say things like A=(X=Y). Variable A will take on a value of true (−1) or false (0) depending on whether X=Y or not. Later in this program, you might code: IF A GOTO . . . and the program will act based on the previously set true/false condition.

This is useful with complex tests, such as this excerpt from a program which tests for leap year:

```
300 L=(M=2) AND (D=29)
                              [Feb 29?]
310 L1=(Y/4=INT(Y/4)) AND
    (Y/100<>INT(Y/100))
                   [Year divisible by 4?]
320 IF L AND NOT(L1) THEN
    PRINT "ILLEGAL!"
330 IF L AND L1 THEN PRINT
    "LEAP DAY!"
```

The program will print ILLEGAL! if the date is February 29 and the year is not a leap year; it will print LEAP DAY! for the same date in a leap year. Try the same thing without booleans; the code is more complex.

Effective Input

INPUT flashes the cursor;
waits for a whole line;
echos to the screen;
hates commas and colons;
allows users to correct as they type;
can misbehave if no data is typed.

GET has no cursor;
works immediately, with no wait;
doesn't show on the screen;
takes any and all keys except RUN/STOP;
is relatively stop-proof.

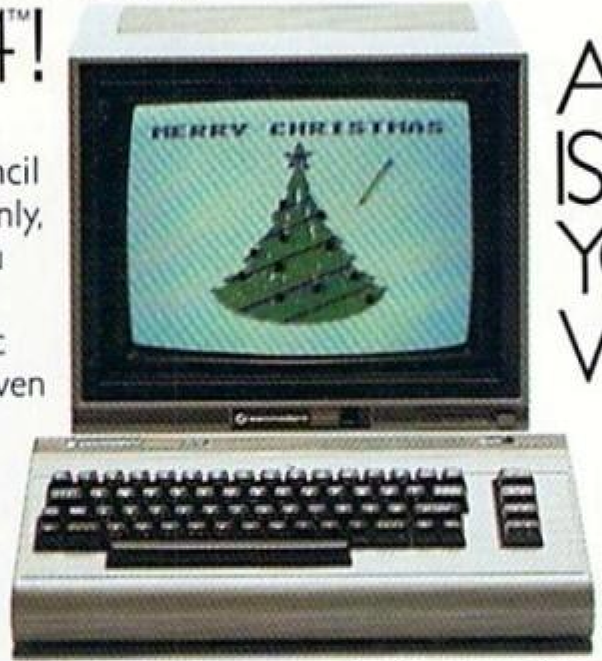
INPUT does more, but is more vulnerable. GET is more powerful and gives you more control, but calls for you to do more coding.

INPUT may use prompt characters to help the user and protect against null input. The user might not know the proper way to answer a question

Continued on pg. 12

SUDDENLY,

YOU CAN DRAW ANYTHING ON YOUR COMMODORE 64™!



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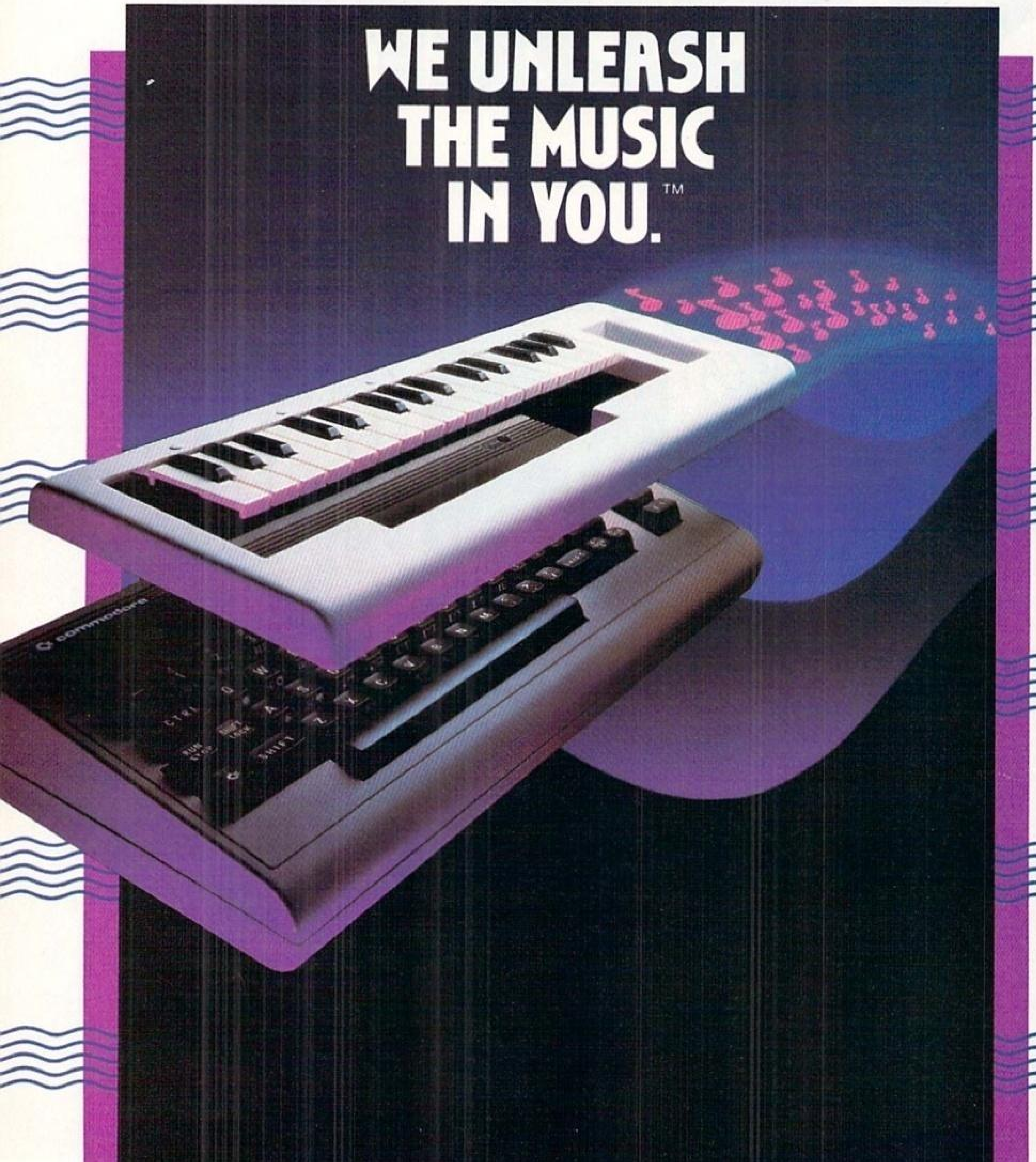
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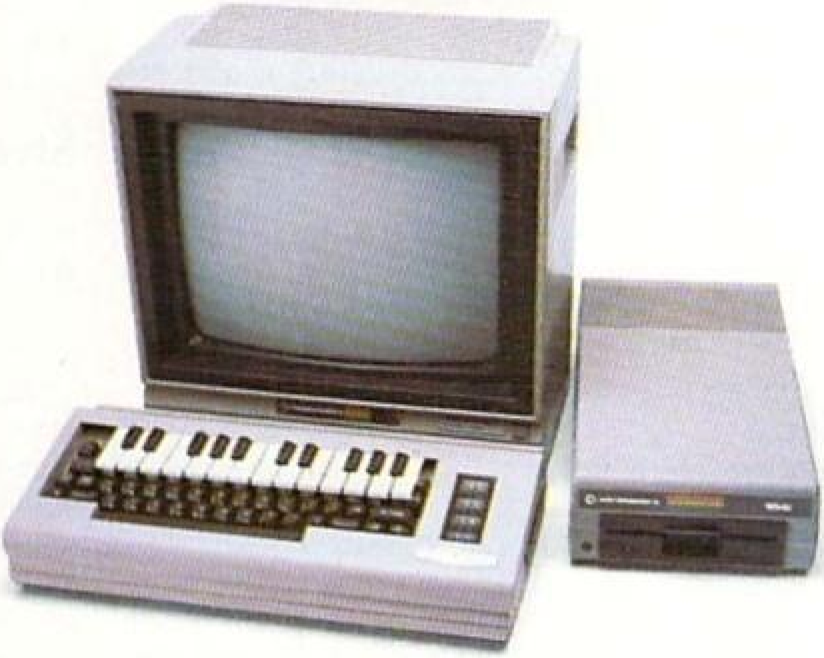

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Continued from pg. 8

such as "MONTH?" Should a number or a word be supplied? The program may help if the input statement is written as follows.

First, the word INPUT; then quotation marks and the prompt question (in this case, MONTH), but do not close the quotes yet; next, two spaces followed by a typical response (e.g., space space JAN); now, press the cursor-left key exactly the same number of times as the spaces-plus-response characters just typed (in this case, five); close the quotes, type a semicolon and give the variable name.

When the program runs, the user will see the question and a sample response, with the cursor flashing over the first character of the response (in the example, over the letter J); if RETURN is pressed, this enters JAN. Otherwise the user may type a response over the suggested one.

This kind of prompt is often shown as: 200 INPUT "MONTH JAN[5LEFT]";M$ . . . where [5LEFT] indicates that the cursor-left key should be pressed five times. It will show on the screen as a series of reversed vertical bars.

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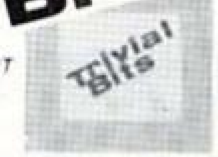

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Alternatives to Input

The following methods may be used to overcome INPUT's bad behavior with commas and colons:

1. Ask the user to put input in quotation marks.
2. Use the GET statement.

The following methods may be used to overcome other INPUT problems, including behavior if the user inputs no data:

1. Use the prompt-character technique.
2. Open a file using a device number of zero (the keyboard). Now use INPUT# to get your data. You'll need to program small changes for the format to look right.
3. Use the GET statement.

The GET statement seems to be a solution to all these problems. It has two major disadvantages, however. It requires extra programming and it may invoke "garbage collection." Garbage collection is an event that might cause the computer occasionally to "freeze" and appear to be dead for periods ranging from a fraction of a second to over half an hour. This event happens at erratic and relatively unpredictable intervals. The freeze time is unlikely to be long if there are no arrays of strings in the program. A full discussion of garbage collection is beyond the scope of these notes.

GET normally accepts a single character, e.g., GET X$; but you can take multicharacters with GET X$,Y$,Z$. GET takes from the keyboard buffer. If no character is waiting in the buffer, GET returns with a null string, i.e., X$=" ".

Courteous programmers echo characters received with GET to the screen. Thus, GET X$:PRINT X$; so the user can see the input. In the following code, characters are received by GET, classified and then added ("concatenated") to an input string I$:

```
250 I$=" "          (answer string)
260 GET X$          (get a char)
270 IF X$=" "
  GOTO 260          (if nothing...)
280 IF
  X$=CHR$(13)
  GOTO 400          (if Return...)
290 I$=I$+X$        (add to string)
300 PRINT X$;       (echo to screen)
310 GOTO 260        (back for next)
```

There is also a numeric GET (GET A). Don't use it, since it can potentially cause a program stop.

Strings

A string is a collection of characters such as "HELLO" or "SORRY, WRONG NUMBER."

A null string is a string with no characters. It's quite important. For example, if you GET X$ and no character is waiting, X$ will be a null string. If I$ is your middle initial and you have no middle initial, I$ will be a null string. Null strings are hard to input. You may PRINT a null string, in which case you print nothing.

You cannot perform any of the following BASIC operations on strings: addition, subtraction, multiplication or division. But you can perform:

CONCATENATION (con-CAT-enation): sticking two or more strings together. Use the plus sign: if X$=HOT and Y$=DOG then X$+Y$ is a new string containing "HOTDOG". X$+" "+Y$ would create "HOT DOG."

LEFT$, RIGHT$, MID$ take part of a string. If G$=FORGOTTEN, then LEFT$(G,3) is FOR; RIGHT$(G$,2) is EN; MID$(G$,4,3) is GOT; and MID$(G$,4) is GOTTEN.

ASC(A$) takes the first character of the string and converts it to the character number: "2" would give a value of 50, since the character "2" is character number 50. CHR$( ) is the inverse function.

VAL(A$) takes the numeric value represented within a string. VAL("2") yields a value of two; VAL("23") yields 23. (Note that ASC would give a value of 50 for both two and 23). If a number is not entirely numeric, e.g., "23 SKIDOO", only the value at the beginning is taken. STR$( ) is the inverse function.

LEN(A$) gives the length of string A$; this may range from zero (null string) to 255.

Remember that all these functions work on expressions as well as simple strings. We can often make good use of expressions such as PRINT LEFT$(X$+".....",6) to arrange information neatly in columns. C

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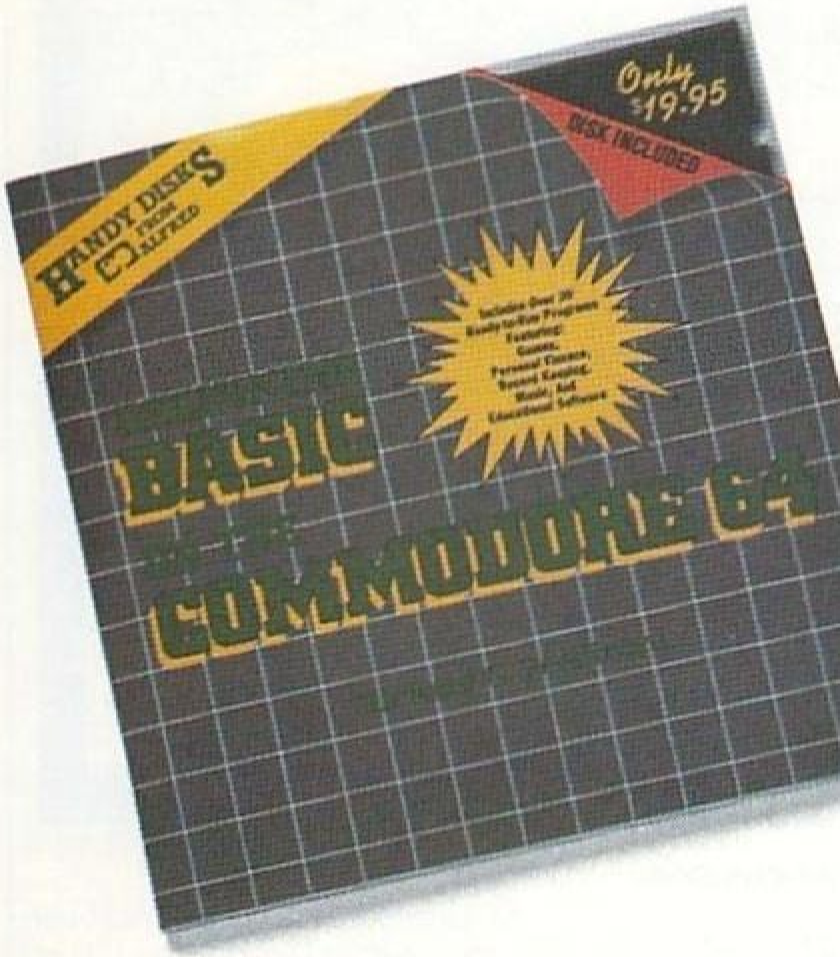
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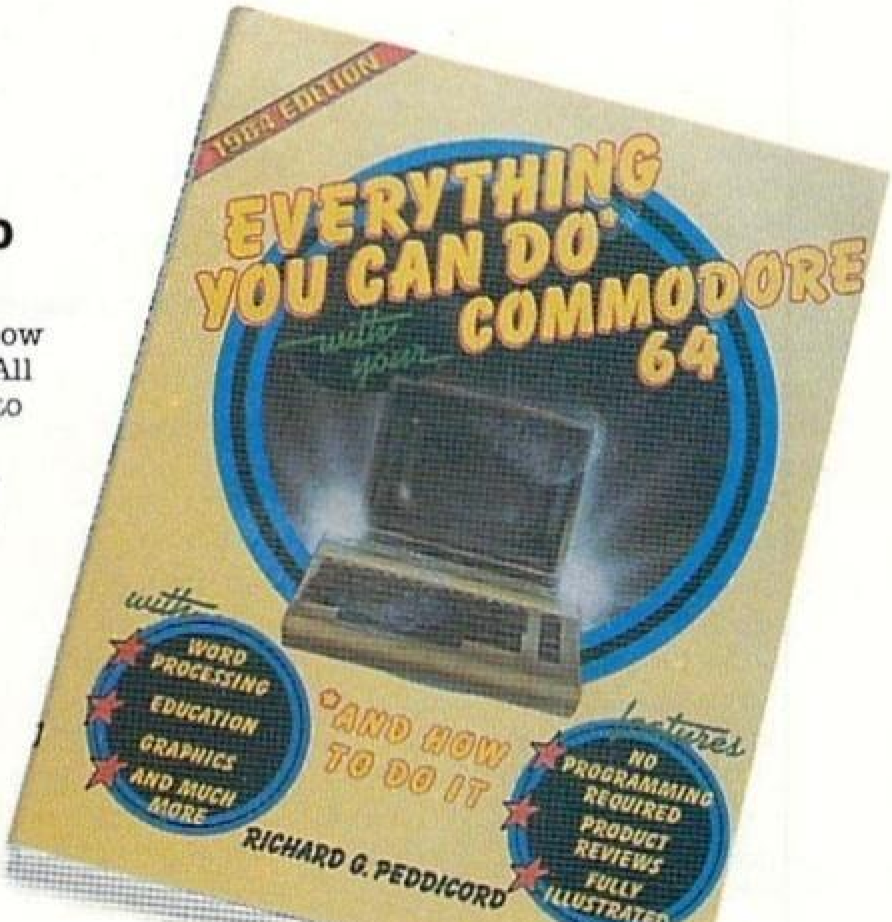
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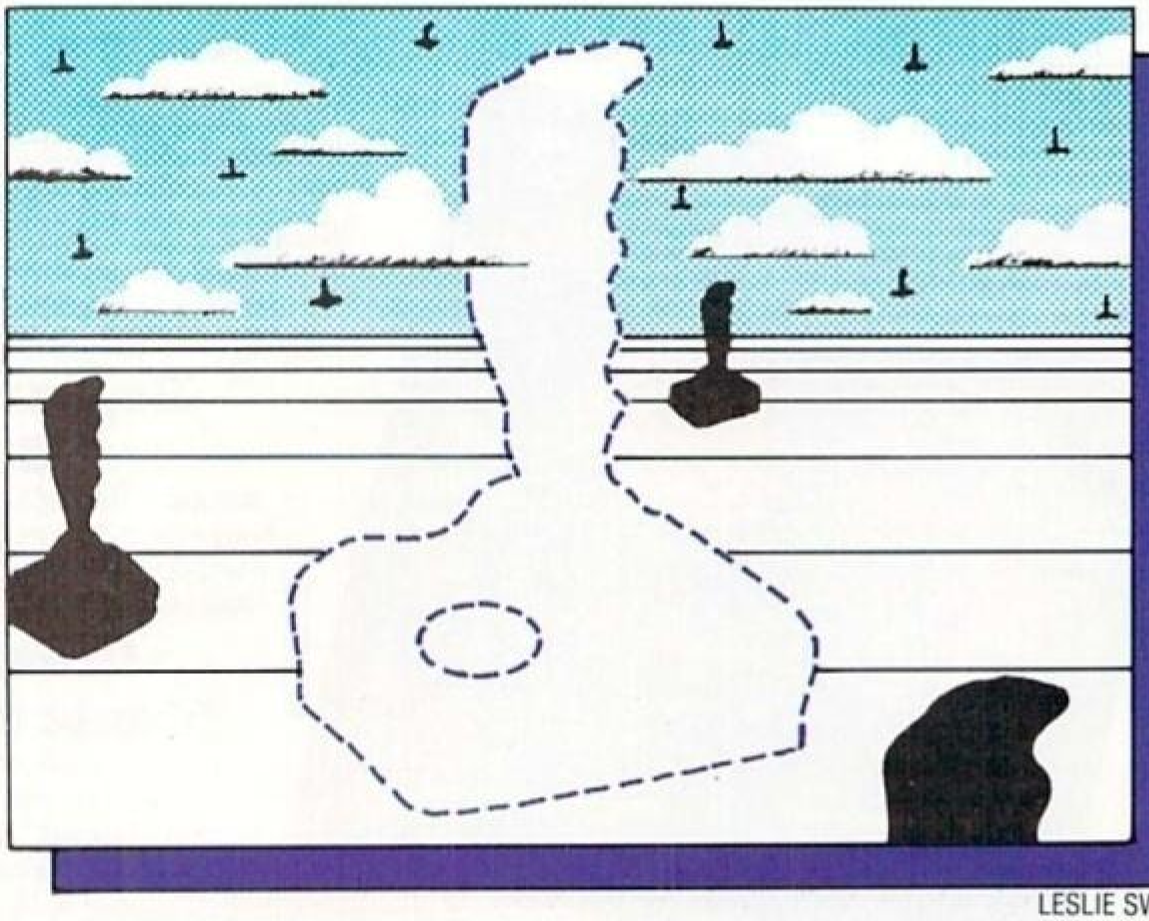
BY STEVE FINKEL

Even Joysticks Get the Blues

A Fairy Tale for the Eighties, with Apologies to Tom Robbins



LESLIE SWAN

A new joystick arrived in the world in the usual way. This baby joystick was like any other baby joystick growing up in a world of joysticks, with one minor difference: it had a blue fire button rather than the conventional red. Its parents, feeling somewhat ashamed that their little bundle of joystick had such an obvious flaw, tried to rationalize that a blue fire button was not the end of the world. They noted that the juvenile control unit had a healthy well-formed base, a firm yet supple stem and a long, pliant cord, and promised to be an excellent game implement. Still, they knew that the joystick that wore a blue denim patch on its genes was different and that nothing they could do would ever change that fact.

All was going swimmingly until the joystick reached that age when peer relationships become increasingly important.

"Blue button, blue button!" taunted the neighborhood sticklets. The blue fire button that had at first seemed so natural to the stick was now exposed in the stick's own consciousness as an azure badge, a scarlet letter that would never be mistaken for scarlet, labelling the joystick as nonconformist, rebellious, marching to the beat of its own percussion section and above all, as alien to the red fire-button culture as a square fire button in a round hole.

But the inevitable growing pains thus accented by these unique circumstances did not, as its parents had feared, cause our protagonist to sing the blues. Quite the opposite, in fact...the more the others tried to belittle its blueness, the more the joystick came to value that royal hue. Shouldering the burden of trauma and notoriety under its blue banner, the young joystick grew strong, fast and responsive, reacting to the slightest prod or provocation with a quiet grace and a sure flow of movement.

The joystick's accomplishments did not go unnoticed by any means. At first, the red buttons had merely considered it an oddity, feeling that the blue fire button was a freak of nature and an embarrassment to its parents. But then, they noticed the considerable skills demonstrated by this deviant with the sky-tinged eye.

"Why should we allow this flawed implement to pollute our livelihood and influence our sticklings with its radical color deformity?" they wondered, their stems shaking wildly to emphasize the urgency of the question. The public outcry was heating up and the blue-button joystick was due for some deep frying.

In the Old West, they might have just strung up the blue-button stick by its cord, leaving it to dangle from the Hanging Tree until the local undertaker got around to cutting it down and planting it in an unmarked grave. (Jesse Jamestick?) Among Amish families, the hapless joystick might have been shunned, ignored by every other member of the sect, including its own family. (It takes a tough Pennsylvania Dutch sect to make a tender shoo-fly pie.)

If the blue-button joystick had been implicated during the so-called Communist witch hunts spearheaded by Joseph McCarthy in the 50's, it would have meant participation in a Congressional hearing. Would they have considered the blue button an all-too-obvious ploy to mask Red sympathy? In colonial Salem, during the New England-style witch hunts, they might have submerged the stick in flame, determining its guilt based on the outcome of the "trial by fire button."

Luckily for the joystick, its own trial lacked the drama and impact of these many fine examples of justice. However, when facing an entire joystick community that sees red, a cool blue pales next to red-hot wrath.

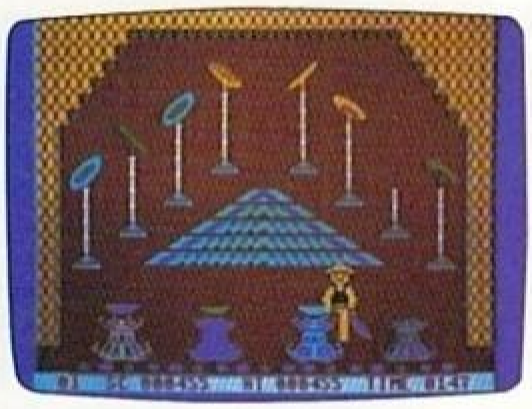
In the famed Scopes or "Monkey" trial, lawyer Clarence Darrow sounded the bugle charge to rescue a young Tennessee teacher accused of tainting the youthful minds of his charges by introducing them to the Darwinian heresy of evolution. Would a Darrow, bugle in hand, appear to make a mockery of a trial based on the red herring of a blue button? Alas, any Darrows in the neighborhood were out getting their horns polished.

The trial was as brief as a sentence and the sentencing was as abrupt as

Continued on pg. 16

Quick.

How many plates can the Juggler juggle?



Chinese Juggler

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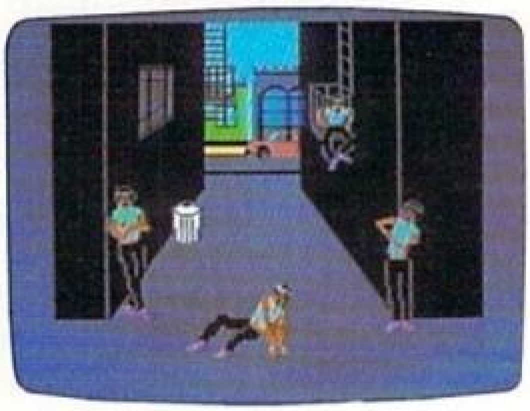

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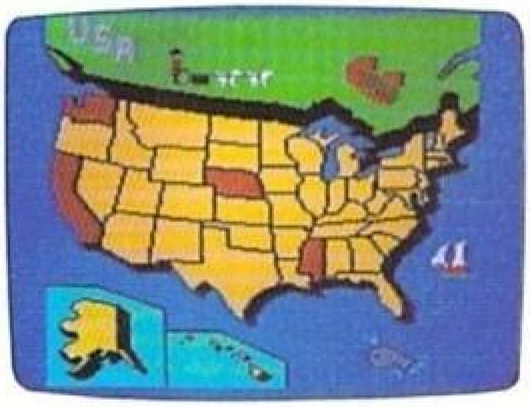

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JOYSTICK LUNATIC

Continued from pg. 14

a period. The blue-buttoned joystick was banished to where it would never again unloose a barrage of missile fire or maneuver a crosshair. No more cheering crowds at sporting events, no more torpedoes slicing through sea breezes, no more lasers sliding through star-scarred darkness. The blue button could feel only the icy cold of being banished forever into the frozen wastes of Business Software.

Spreadsheets have a certain bloodless feel to them. Spreadsheet operations do not make the heart pump and the adrenaline flow. They are useful, efficient, sensible and as exciting as vacuuming the carpet. Word processors are not better, while money management programs are decidedly worse.

The essence of the joystick is flight, freedom and control of destiny... elements tied to the scope and the soaring feeling of the cloudless sky. The blue sky. If this story were a Twilight Zone episode, Rod Serling would be grimacing, informing our joystick friend that it had just entered Joystick Hell.

Stunned by the severity of the sentence, the now outcast joystick refused to plunge into the deep end of despair, preferring to bob along at the surface of mild depression. The unfortunate truth was that joysticks and business software go together in a fashion comparable to the way penguins relate to toenail clippers.

So, imprisoned in a spreadsheet cell, staring out into the open spaces through the bar graphs of his cell window, detained in a database dungeon (escape possibility: enter the database file for the letter "B" and attempt to file the Bars), the joystick reached the point of giving up.

Is there a more hollow sound than "giving up"? "Giving up" creates echoes through the mind like bamboo drumbeats. To give up is to stop trying and when a joystick stops trying, it is basically useless. (Ledger sheet line 10—fire—nothing happens! Aliens in line 17, column 4 — can't fire, can't maneuver — "She dinna wanna react, Captain!" "Go to manual keyboard, Scotty!" "Dammit Jim, I'm a doctor, not a typist," growls McCoy.)

Uncooperative joysticks are not covered by any warranties, aren't good for double their money back and are only marginally successful as tax write-offs. As such, they are often discarded with an angry bellow and a reverse dunk into the nearest waste receptacle. And it, indeed, finally came to just that. The joystick found itself adrift in a sea of garbage, tossed among the depths filled with milk cartons and half-eaten tuna sandwiches, waiting for the tide to take it out to the curb.

> ***The essence of the joystick is flight, freedom and control of destiny . . . elements tied to the scope and soaring feeling of the cloudless sky. But the blue-button joystick felt only the icy cold of being banished forever to the frozen wastes of Business Software.***

Even after sinking to this ultimate depth, the joystick's blue eye glared defiantly without blinking, challenging any passer-by to stare it down. Save for the possibility of a color-blind trash picker, all seemed lost. Reprieve came in the form of strong winds, scattering the evening's trash to three of the four corners of the earth, which is okay since the fourth corner consists mainly of tourist traps and fast food restaurants. To the joystick, freedom tasted like a rain forest orchid to a bee going through pollen withdrawal. The blue button was fired up, determined to undertake the challenge that lures any joystick worth its plastic: the high score.

Shaking off cobwebs and crust, rheumatism and rust, debris and dust, accumulated from time spent on business software, the blue-button joystick began pumping itself into a blue funk, swinging its stick like a welterweight contender throws jabs. The challenge was at hand and the flavor of the month was blue.

Wisdom knocks on many doors, and rings countless doorbells. All too seldom is the calling card of wisdom pocketed. Wisdom comes more easily to some than others, joysticks included. The lesson scrawled on the blackboard of the joystick's experience was written in wisdom-colored chalk. (If you've been following this along, waiting for a coherent statement expressing a moral of sorts, put your contacts back in now.) After hours of practice play, a realization sifted its way into the consciousness of the joystick. Rather than compete out of bitterness and vengeance, the joystick was determined to fire that blue fire button for the sheer joy of playing and playing well. The high scores and acclaim would be there if the play quality was good enough, but the important thing would be just to play.

In the Joystick Hall of Fame, spotlights pour their liquid glare on the history of the joystick, exhaling their illuminating breaths onto the unsuspecting momentos and displays of great joystick achievement . . . the banana cream pies, the July 4th fireworks, the '57 Chevies, the *Gone With the Winds* of classic joystickery.

In the Great Hall, showcasing the greatest of the great, the line of sticks is an overwhelming sight. Honored there are the greatest high-performance joysticks ever created, with an array of stems looking like a skyline of smokestacks, clothespins, candles, Eiffel Towers, telephone poles, umbrella handles and gun barrels.

Beneath every great stem, there is, of course, a base. The variety of base sizes and shapes forms a plastic metropolis, burgeoning with skyscrapers, row homes, Cape Code cabins, Victorian mansions and crumbling tenements. ("More than you can shake a stick at," cackles the feeble old guide, grinning toothily at the pun that has endured generations of tours.) But the smorgasbord ends there. There are some differences in the shapes of fire buttons; some are ovals, some round, a few even square. A glance at the fire buttons, however, reveals one cherry-top after another, a breadcrumb trail of rubies, rows of plastic roses. But at the end of the row has been planted a single violet. A blueberry in a field of strawberries.

That's as happy as an ending will get in the eighties, kids, so enjoy. **C**

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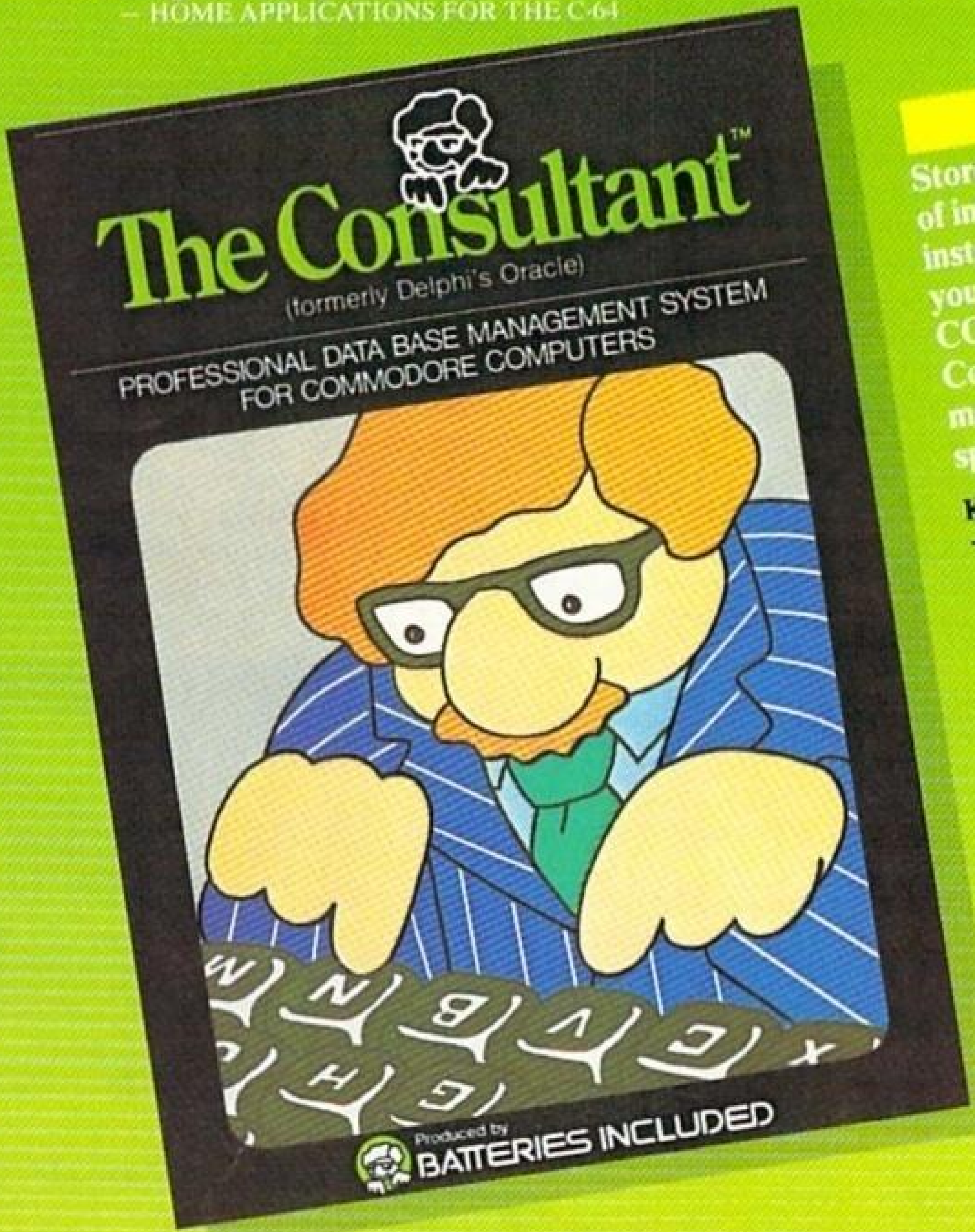
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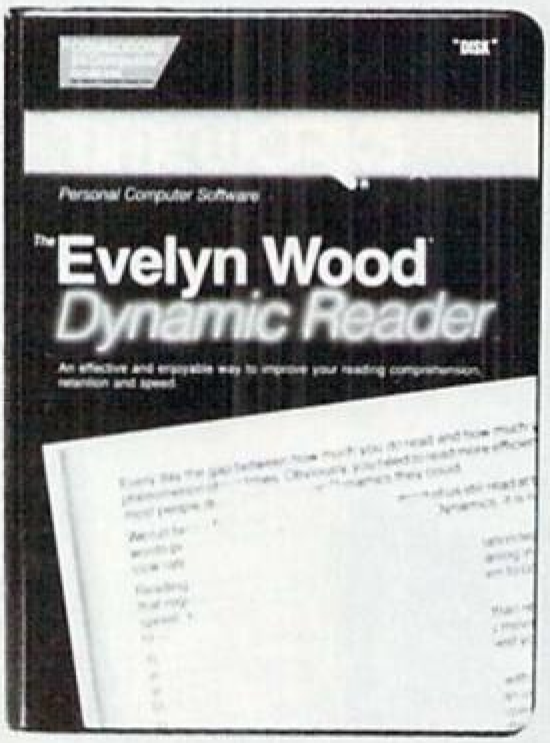
POWER PLAY'S NEWS FROM THE FRONT

Kwik-Load

Datamost, Inc., a major publisher of home computer software and books, has announced the release of a revolutionary new disk utility for the Commodore 64 called Kwik-Load.

Kwik-Load includes a copy program which copies individual files for a complete unprotected Commodore 64 disk three times faster with one drive and five times faster with two drives. Kwik-Load features full disk editing, allowing you to rename, delete and undelete files, validate and format disks (in 10 seconds), edit any track or sector, print out sectors and get a directory of the disk faster.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Improve Your Reading

Timeworks of Deerfield, Illinois, has introduced a personal computer software program for improving reading comprehension, retention and speed entitled, **The Evelyn Wood Dynamic Reader.**

Under agreement with Evelyn Wood Reading Dynamics, Timeworks has concentrated the program in a single package containing two disks and a user's manual. One disk contains the operating programs. The other contains text and comprehension quizzes for the reading exercises.

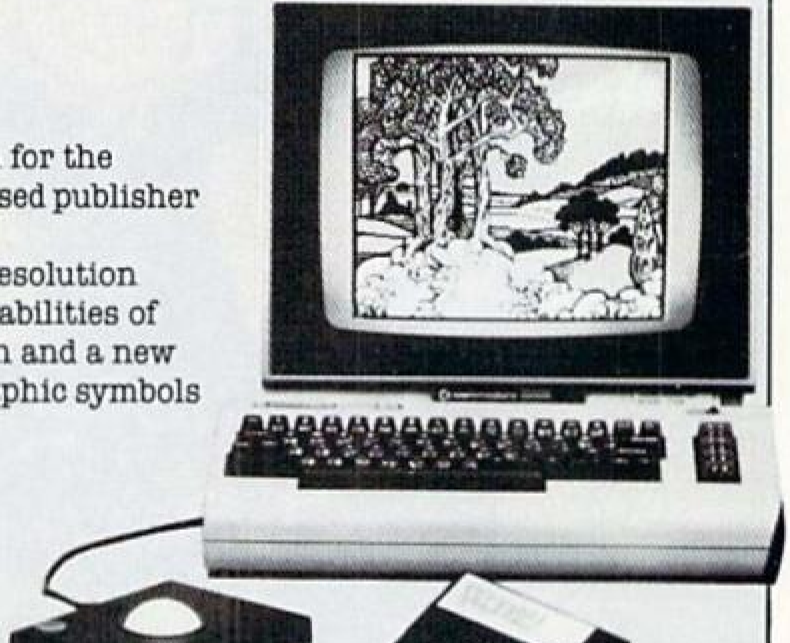
The program allows the use of some techniques that cannot be performed in traditional textbook study. As the user progresses with the program, his or her progress is automatically measured and recorded. Color bar charts can be called up on the screen so that users may graphically review the results of their efforts. Additionally, the computer allows users to adjust the speed at which reading exercises can be performed according to their individual skill levels.

Reading comprehension and retention are stressed equally as much as the level of speed at which the person reads, because, according to Evelyn Wood, all three are very much interrelated.

New Graphics Program

DOODLE!, a powerful, versatile color sketch pad graphics program for the Commodore 64, is now available from City Software, a Milwaukee-based publisher and marketer of computer software.

DOODLE! features precise trackball or joystick operation, high-resolution graphics, program flexibility and super ease of use. Two unique capabilities of **DOODLE!** include the ability to print out hard copies from onscreen and a new stamp feature which lets you create nine of your own repeatable graphic symbols or designs.



New Editor Assembler Package

Robin's Software has announced the introduction of a new editor assembler package for the Commodore 64. The package is called the IEA Instant Editor Assembler and has a retail price of $19.95.

The package includes a combination editor and assembler program, a full-featured monitor and a walk program with a variable step speed and the ability to add breaks. All three of these programs may be resident in memory at the same time and a SYS is used to jump between them. In addition, jumping to the monitor or walk programs does not affect any program you've entered in memory. The individual programs are written to be easy to understand, easy to use and to work quickly and efficiently.

The disk which contains the main programs also contains six programs assisting in the use of these programs and more than a dozen additional utility and example programs. The manual, while not being a machine language tutorial, does provide a complete description of all commands and many examples to help you to use the package.

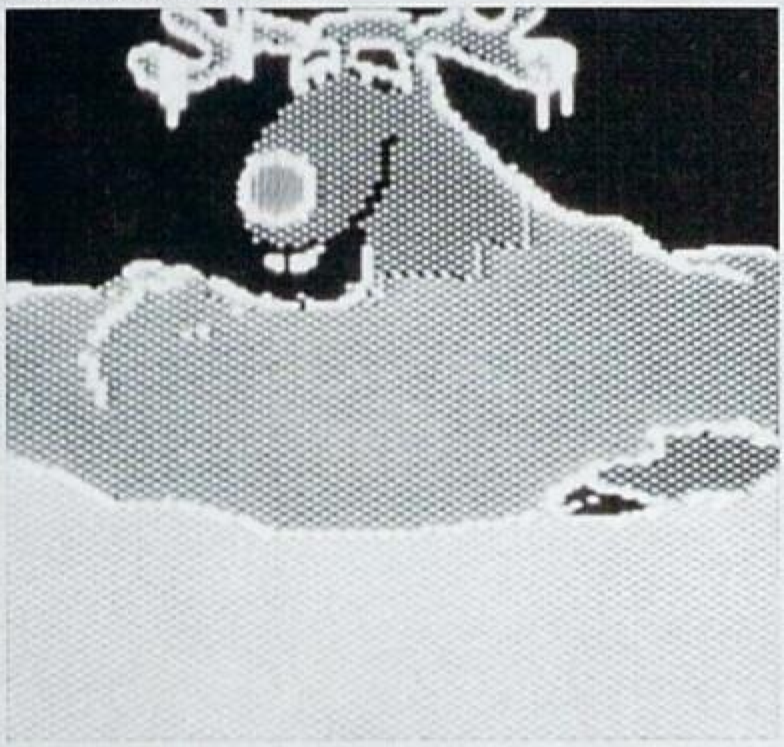
An added feature of this package is a technical assistance telephone number to aid you with any problems or questions you might have.

POWER PLAY'S NEWS FROM THE FRONT

Tuner Turns Monitor into Television

TAXAN Corporation announced its new model 305 television tuner which will enable anyone using any brand of composite monitor with audio to convert their monitor to a color television. Because of the higher CRT quality in monitors over televisions, the monitor-turned-television will have a much clearer picture than most regular televisions.

The new tuner will be sold in computer stores and other outlets handling composite monitors.



Christmas Adventure Game

BitCards Inc. announces the release of an adventure program written for the holiday season called **A Christmas Adventure.**

Set in and around Santa Claus' ice castle at the North Pole, the player will discover at the outset of the adventure that Santa has mysteriously disappeared. With Christmas only hours away, his annual gift-delivery run is in grave jeopardy! The player's mission is clear: explore the many rooms of the castle and its outbuildings, unravel the mystery of Santa's disappearance and find and free him to save Christmas.

Anticipating that many people may wish to purchase additional copies of **A Christmas Adventure** as holiday gifts, BitCards is simultaneously releasing an enhanced version of the program designed specifically for this purpose. A utility provided allows the buyer to customize the program, such that the recipient will discover a holiday greeting and several references to himself as he progresses through the adventure.

Free Access Software Database

Searchmart Corporation, a North Palm Beach, Florida, firm specializing in computer databases, has announced that its free access Software Library is now online.

Anyone with data communications capability can log on to this revolutionary electronics software locator service and find descriptions, prices and other details about each of the thousands of software products stored in Software Library's database. Updated facts on applications, operating systems, language compatibilities, memory and configuration requirements are provided for mainframe, mini and micro computers.

By offering this service, Searchmart hopes to eliminate the difficulty software buyers face when they try to sift through the tens of thousands of software products on today's market, not to mention their often futile attempts to locate software products being introduced at a rate of hundreds per month.

Another feature planned for the Software Library is the New Software Products file. Searchmart will offer this service as a separate database for users interested in learning what new software products have come on the market. This will be open to all software manufacturers and vendors who advertise on the database.

Tech-Sketch Reduces Price of Graphics Package

Tech-Sketch has reduced the price of its graphics system for the Commodore 64. The package, which includes the well known Micro Illustrator program diskette, is the lowest-priced light pen graphics package available for home computers. Suggested retail price is $49.95

"Ghostbusters" Software

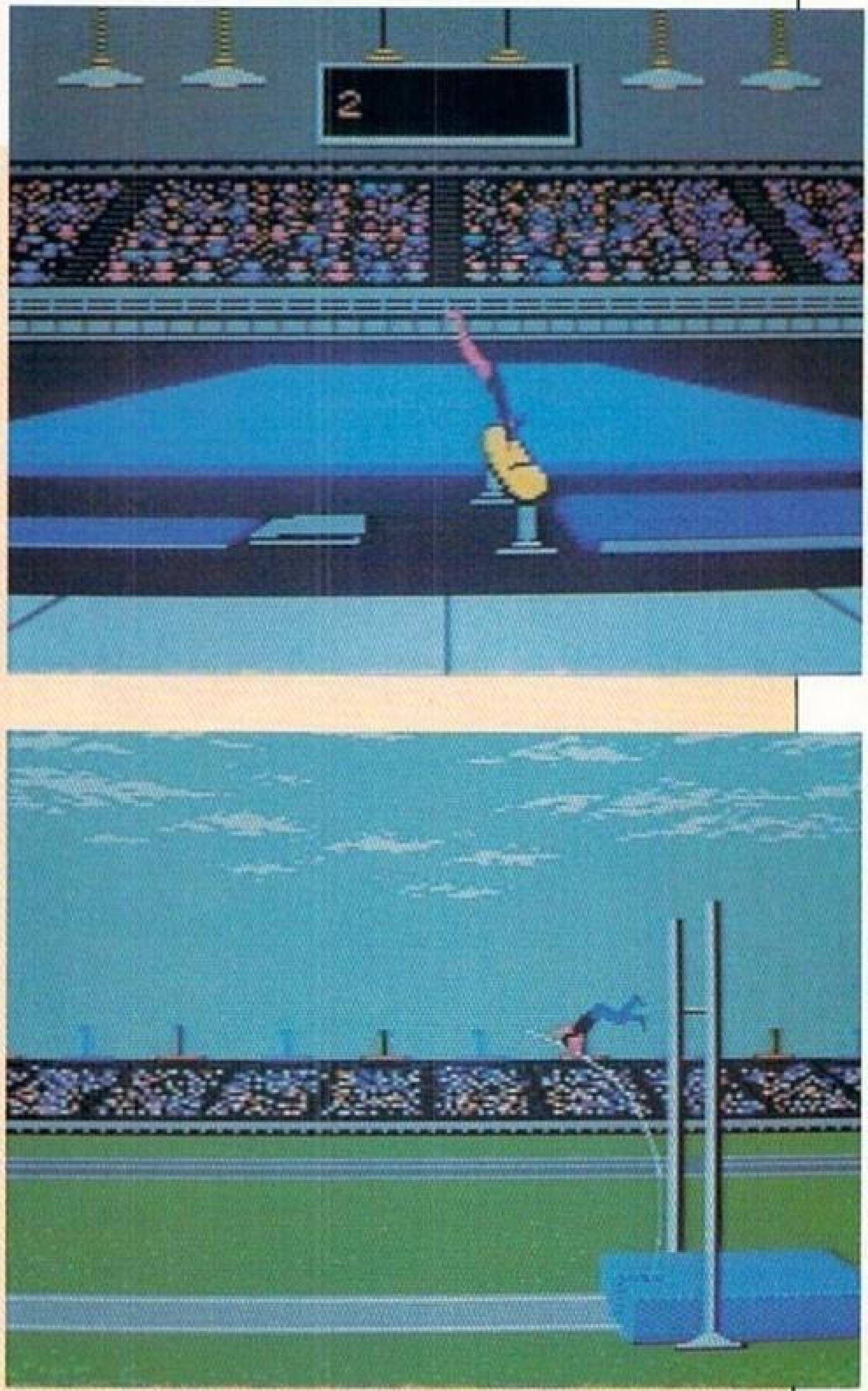
Activision has announced that it will develop and market an original work of home computer software based on the hit motion picture "Ghostbusters." The rights to develop "Ghostbusters" were acquired from Columbia Pictures.

REVIEWED BY JOHN O'BRIEN

Summer Games

Computer: Commodore 64
Publisher: Epyx
1043 Kiel Court
Sunnyvale, CA 94089
Medium: Disk

If you were disappointed with the Soviet boycott of the 1984 Summer Olympics, this is a game they did show up for.



Gymnastics (top) and pole vaulting challenge your joystick abilities.

Epyx's *Summer Games* consists of eight events which can include up to eight players. The challenging events are vaulting, platform diving, gymnastics, skeet shooting, 4x440 relay, 100-meter dash, 100-meter freestyle and the freestyle relay.

The preliminaries to the games are almost as much fun as the games themselves. The games open with the traditional lighting of the Olympic flame. Then the Olympic song is played and white peace doves are released. When you choose what country you want to represent, the national anthem for that country will play, unless, however, you're tired of it. Then you can just move the joystick and the anthem stops.

The winner's anthem plays after each event and winners of the gold, silver and bronze medals are announced. If you play all eight events, the winner of the most points is honored in a Champion Ceremony. Updated high scores are kept in the world records and can be viewed at any time.

The menu gives you six options: compete in one event; all events; just practice an event (in the practice mode, you can try an event over and over until you get the hang of it while no scoring records are kept); choose the number of joysticks you want to use, see the world records or just replay the opening ceremonies.

The scoring is the way it is done in the real Olympics. In the races, whoever comes in first wins, but in diving, the judges hold up point cards based on how clean your dive is. In other words, belly-flops get zeros and a perfect dive with no splash gets a ten. As in the Olympics, the high and low scores are eliminated and the remaining are added. This total is multiplied by a difficulty rating from 1.0 to 4.1, depending upon how sophisticated a dive you attempt.

The scoring adds an extra challenge to this event, because you must use different strategies. Conservative dives will get you a good rating from the judges, but a low difficulty rating. Risky dives will often result in low scores from the judges, but you can make up the difference on the difficulty rating. But with risky dives, you may belly-flop and get zeroes from the judges. And remember, zero times anything equals zero.

All play action is controlled with a joystick. In some events, like diving and gymnastics, you control twists and turns in the air by pointing the joystick. In gymnastics, for example, forward is a full tuck, full rotation and center is a layout position with medium rotation. You must make sure you pull back on the joystick in time for your landing or the gymnast has to break her fall with her face or rear end. (Ouch.)

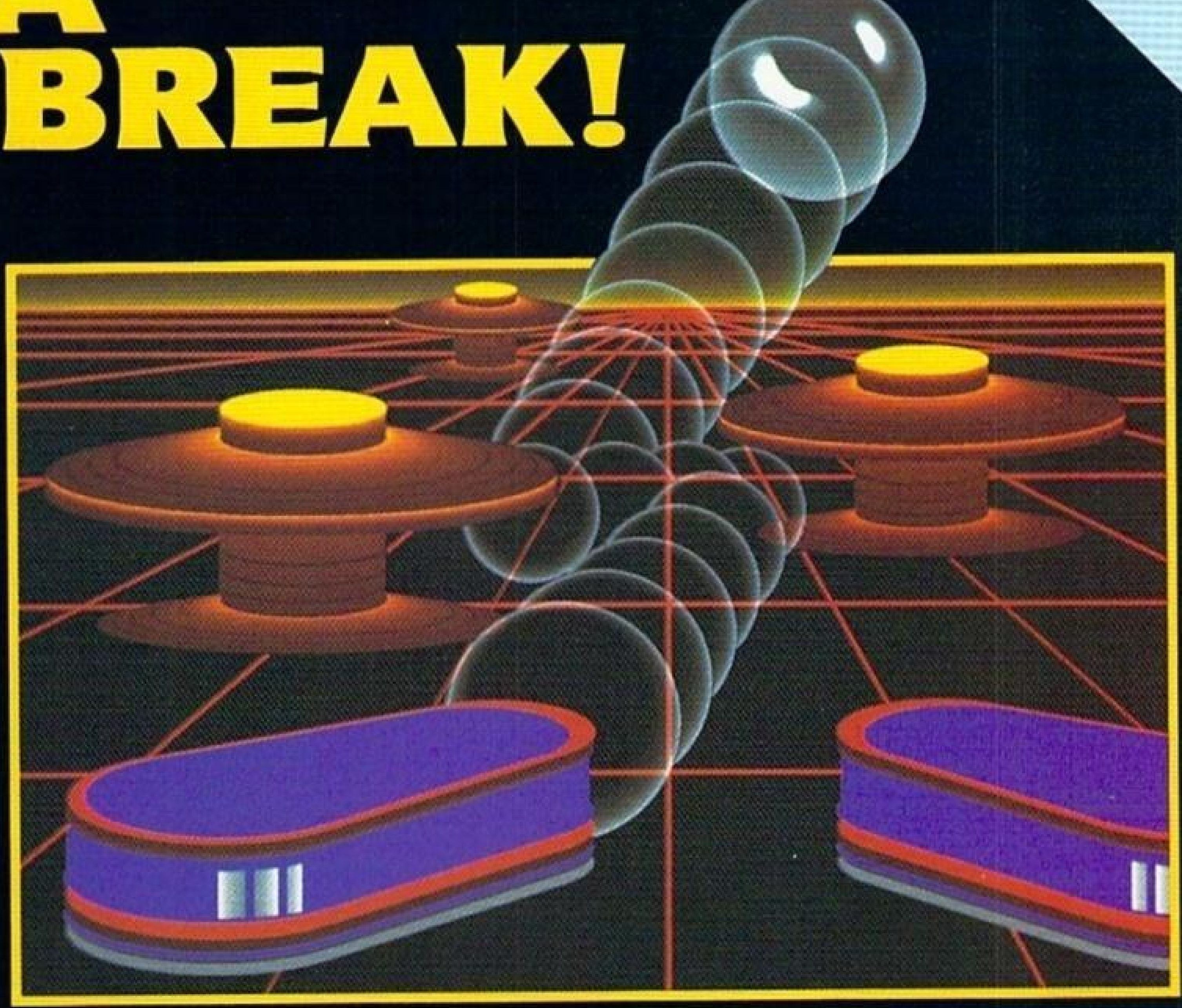
In almost all the events, timing is the key. In the swimming races, you just hit the fire button every time the swimmer's arm hits the water, but for top speed, you have to hit it just right. Controlling your runner in the 100-yard dash is most unusual: you must move the joystick up and down or back and forth as fast as possible. People get frantic with their movements and this could look pretty strange to someone who walks in on you while you're racing. It also tires your wrist and makes you glad that the longer races aren't controlled this way!

Pacing is the key in the longer

Continued on pg. 22

TAKE A BREAK!

For Commodore 64



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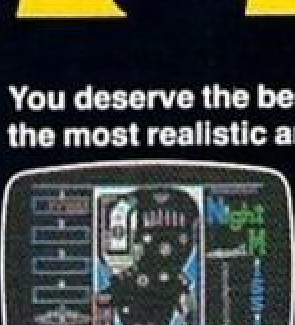

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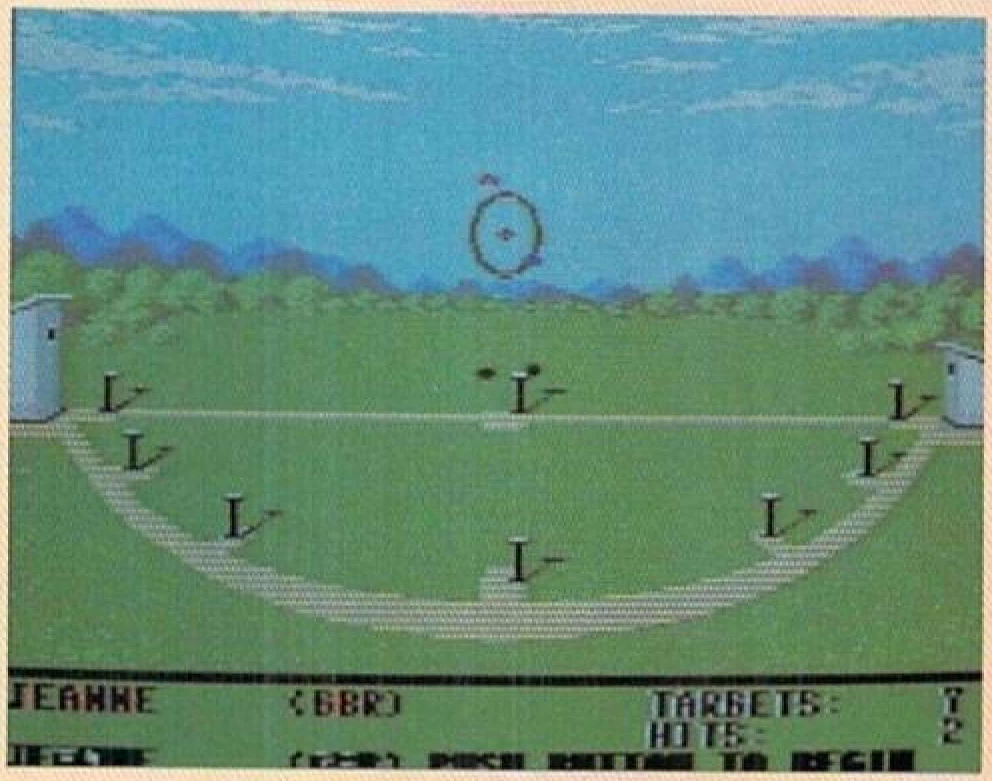
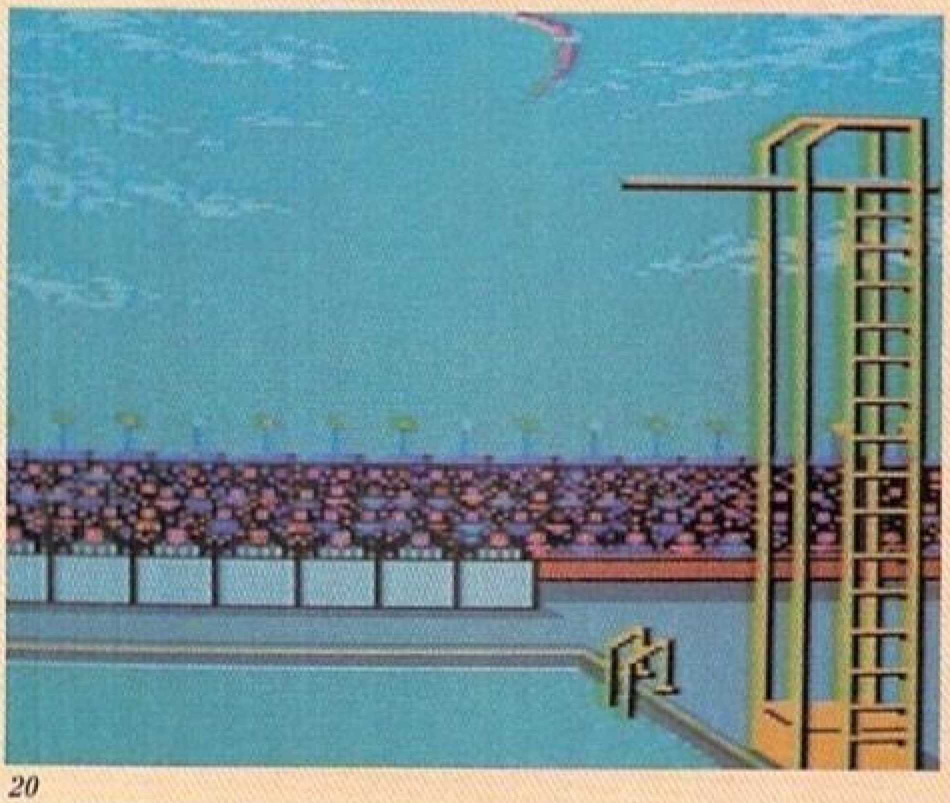




Skeet shooting (top) and diving require split-second timing.

Continued from pg. 20

races. You keep the joystick centered for normal running, but you must coast by pushing to the left.

In skeet shooting, the controls seem pretty simple, aim and shoot, but your gun is heavy. You can't hold it in one spot too long or it drifts. Your timing and aim have to be developed to get good at this one.

My only complaint about *Summer Games* is that two of the events, pole vault and gymnastics, are very difficult to master. In gymnastics, you have to use anywhere from six to ten separate maneuvers with the joystick in about two seconds time. You can get the hang of it, but it takes quite a while to gain some expertise.

Pole vault is the real killer, though. I estimated that out of my first 50 attempts, three were successful. It took so much time to practice this event that I think I could have learned how to pole vault for real in a shorter amount of time! It's not just me (if that's what you're thinking), because I thought the same thing, so I watched a few other people try and they all had about the same amount of luck. Admittedly, some people had a lot less trouble with it, so it is possible.

The complaints notwithstanding, this is still one of the better games I've seen. The fact that there are eight events to play assures that you won't get tired of it too fast. The graphics are excellent and all the games are well conceived and accurate down to the last detail. My two favorites—diving and skeet shooting—are worth the price alone. **C**

Wizard

Computer: Commodore 64
Publisher: Progressive Peripherals and Software
2186 South Holly, Suite 2
Denver, CO 80222
Medium: Disk

Take the graphic variety of *Jumpman*, add the construction capabilities of *Lode Runner*, throw in some magic spells, toss some sound effects on top and you get a rough idea of *Wizard*.

Wizard is a new "running and jumping" game from a relatively new company called Progressive Peripherals and Software. I must admit that, in this instance, the progressive reference is truly warranted. *Wizard* has 40 screens divided into four levels of ten screens each. There are two additional levels of play offered, for a total of six. The fifth is customized and is composed of screens that the user has constructed (more on that later). The sixth level randomly selects from all 40 screens.

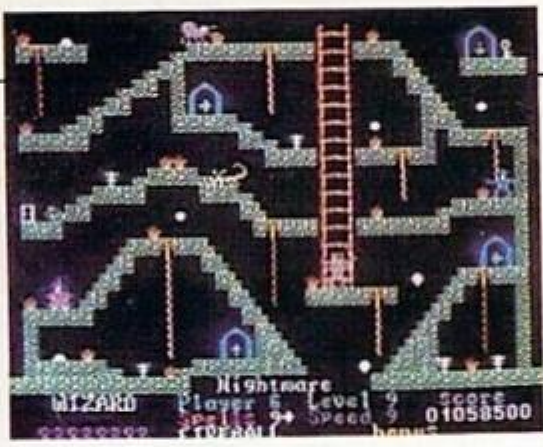
The object of the game is not unusual: complete as many levels as possible before you run out of wizards (you start with five—quite generous). The trick of completing each level is to find a key and take it to a keyhole. As you may have guessed, determining which key or keys in each level should be taken to which keyhole is part of the secret.

Throughout the screens are the usual ladders, ropes, stairways, gaps to jump, monsters to outwit and bonuses to accumulate. Of course, missing a rope, underjumping a gap or being caught by a monster means death to Wilfred (that's honestly his name) the wizard.

Before you think that this is just another one of "those" games, let me elucidate some smaller details.

Both the graphics and the sound effects in *Wizard* are excellent. Right from the introductory screens, you can hear and see what to expect. Every move the wizard makes and every event has its own sound effect. It's almost like listening to "Peter and the Wolf". Personally, my favorite sounds occur when a new level appears on the screen and when Wilfred

REVIEWED BY JIM GRACELY



climbs ladders. The graphics are just as impressive. Sprites are used for many of the bad guys in the various levels including giant rolling rocks, fireballs, bats, rats, witches and snowflakes. Some of the more unusual obstacles include vats of lava, trap doors and stairways that disappear.

The two other unique features of game play include spells and portals. Each level has a spell for you to use after you get a key on that level. The spells range from feather fall to fireball and disintegrate to levitate with a number of others in between. Spells can be cast by either pressing the spacebar or pulling the joystick down and pressing the firebutton. A good hint would be to stick with the space bar. It is a little hard to get used to, but how do you coordinate pulling the joystick *down* when you're trying to go *up* a rope?

The portals are little blue doorways with arrows in them. When you enter one, you become an invulnerable ghost image and travel across the screen in the direction of the arrow. Just something a little different to help you get out of a jam. Be careful though, of teleporting yourself into a closed-in area! In fact, in one level, "Dark Tower" (#25), you can teleport yourself into a wall! If this should happen and you've already killed both bats, well . . . time to turn off the computer and restart the program.

No matter how wonderful a running and jumping game is, eventually you get to a point where you know all the screens and long for the excitement of exploring and solving new screens. Most games just look you in the eye at this point and say, "Tough luck buddy, what you see is what you get." Fortunately, *Wizard* never comes to this. Whenever you feel that you are ready, you can construct your own levels!

In addition to the 40 screens on the game disk, you can construct another 60 of your own. There is a complete screen editor program on the game disk which allows you to develop the layout of the level. You can pick your favorite ladder, rope and monster colors. You can choose to have 16-ton weights fall on your head during a level or to be chased by a giant rat. Ladders and ropes can be placed anywhere on the screen, along with bonuses, keys and keyholes. This is an excellent extension of this game and will maintain the fun long after you have all the levels memorized.

The people at Progressive Peripherals and Software have told me that they have just completed a screen construction competition and the best 20 screens will be available for the 1984 holiday season. In addition, they are developing a special *Wizard* expansion set with additional traps and monsters to work with, along with another 20 levels! This will give you many additional hours of fun and the ability to create even more advanced levels.

Concluding, I have to give *Wizard* the best possible evalution. It is enjoyable to play and it will keep you playing for many hours to come.

Here are some hints that my assistant game reviewer (and wife), Donna, gave me to help you get through some of the levels. (I can't help it if she's better at the game than I am!)

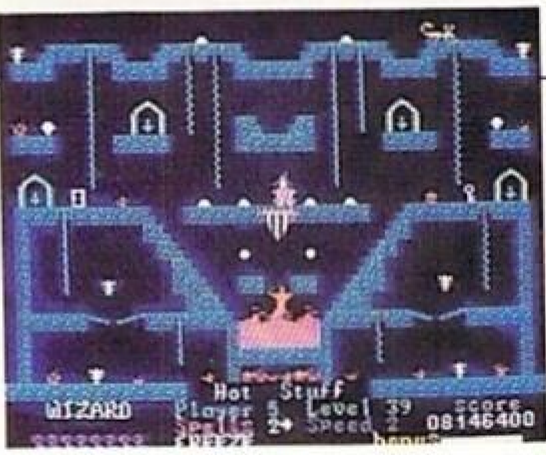
Level 2, Shadow Lord: As soon as you get the key you gain the invisibility spell. If you use the spell, each time you touch the Shadow Lord you become more visible.

Level 4, Diamond Mine: Get the key first. At the bottom of the screen is a wall, located to the left of a couple of bonuses. Touch this wall and it will disappear and two additional keyholes will appear.

Level 5, Trash Masher: Build up your score by getting all the bonuses at the top of the screen. Move across the screen to the portal in the right corner. This puts you at the top of the screen and the rest is up to you.

Level 6, Key Slime Pie: Move to the right, up the steps, and then down the rope. Use the portal pointing left and jump onto the left half of the screen. Start climbing here and get the key.

Level 7, Great Balls of Fire: Get a key right away. This gives you a fireball spell (which you will need). Collect all of the keys on one side of the screen and then make your way to the keyhole on the same side. Have those fireballs ready!



Level 8, Simon Says: Get only what Simon says or pay the consequences (getting the key and putting it in the keyhole are freebies).

Level 10, Aeropics: Beware! The bombs will start falling whenever the wizard is at the beginning of the level. So move!!

Level 11, Haunted Castle: Work your way to the key while avoiding the bat. This gives you the levitate spell. Move left across the screen to a position directly below the keyhole, then levitate up to it. Don't levitate through the monster!

Level 13, Phantom Archer: After getting the key, use a fireball to destroy the sliding gate at the lower right portion of the screen. Destroying that gate makes it easier to get to the keyhole without getting killed by the phantom's arrows.

Level 14, Leap 'n Wizards: Start the level by moving up the rope in the middle of the screen, but be careful of the arrows. Get some extra points (after getting the key) by teleporting to the bottom of the screen and working back up to the keyholes.

Level 23, Treasure Island: Climb the ladder and then move right into the portal (pointing right). Use the portal at the far right to go up. As you are going up, you can use the joystick to adjust the direction. Aim for either the ladder (it will appear on the way up) or the platform. Use the portal under the two sliding gates to get the key. The sliding gates come up through the floor of the steps, so avoid walking over them!

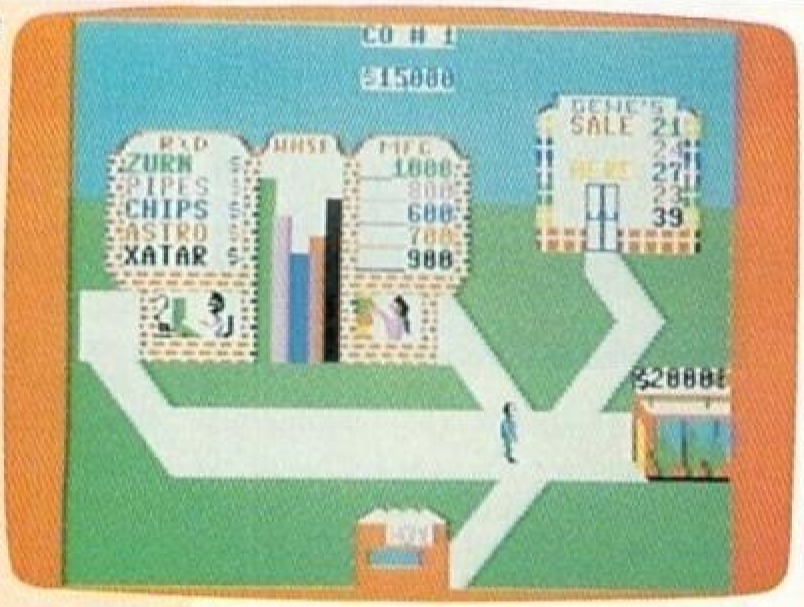
If you have made it this far, you've probably figured out most of the tricks and strategies. The rest of the levels are up to you to figure out (or you can buy the solutions from Progressive Peripherals and Software). Have fun! **C**

REVIEWED BY TED SALAMONE

In The Chips

Computer: Commodore 64
Publisher: Creative Software
230 E. Caribbean Drive
Sunnyvale, CA 94089
Medium: Disk

> *Unlike most educational software programs, which teach their lesson by rote,* In the Chips *creates a real-life business environment.*



Sound and graphics, while present and accounted for, are not the main attractions of this program. Nor should they be. As long as they are good enough (and they are) to hold user attention over time, they have done their job.

The meat of *In the Chips* lies in the scenario. It is realistic, extremely well executed, enlightening, and even fun! If it didn't educate so well, it would make a whale of a beginner's strategy game.

One or two entrepreneurs invest $100,000 in electronic currency in a head-to-head (or head-to-CPU) competition to determine who has the most marketing and business savvy.

New products must be developed and then produced in the correct quantities. Price points have to be set and advertising arranged. All of this takes plenty of dinero, so cash flow, return on investment and expenses all need to be tracked religiously.

This audit trail is no problem as the 64 keeps track of the finances for both parties. Working on a quarterly basis, future moguls take turns at the keyboard implementing their particular strategies. Both players must turn away from the screen as the other inputs so everything will be on the up and up. After all, *In the Chips* doesn't promote industrial espionage!

In the Chips is not intimidating. A brief pass through the small foldout instruction manual is all that's needed to get going. Actually, booting the disk, watching the demo and referring to the instructions when in doubt, works better than trying to learn the ropes from the guide before checking out the program. Experiment. Go ahead, be daring. Run it, then look at the manual. You'll be pleasantly surprised.

Of course, this doesn't mean *In the Chips* is so simplistic that perusing the manual doesn't do any good. On the contrary, each simulation, though within set parameters, is different. The variety, hassle-free startup and actual playing enjoyment are just additional benefits when one considers the thought processes and logical execution needed for success.

Using a joystick to guide an onscreen alter ego, computerists first go to Research and Development to develop anywhere from one to five products. These items are constant from game to game.

Once that's settled, the entrepreneur has to establish inventory levels in the manufacturing facility. Finished products are then stored in the adjacent warehouse in the form of proportional, color-coded bar graphs.

Next, a sales meeting is held to set the retail price for each product. Cost per unit (no matter how many of any type are made) is always $10.00. Of course, this fails to reflect the principle of economics of scale and the varying costs of developing and producing different products.

However, there are nuances to *In the Chips*. Riding a market created by a rival is one and the inclusion of a monopoly/no monopoly option is another. The former is self-explanatory while the latter refers to the lack or presence of a minimum selling price, the number of firms competing, the number of business prices compared against and the number of companies which share in sales when the other player depletes stock.

Last stop is the advertising agency, where substantial sums must be spent to make the items household words. Scrimp here and there will be plenty of red ink when the books are reviewed at the start of each quarter.

The financial summary is essentially a stripped down version of a Balance Sheet and an Operating Statement. It does provide a wealth of information nonetheless.

Cash on hand, inventory value and total profit are included as well as sales in dollars, cost of goods sold, advertising expenditures and development expenses. Net profit as of the previous quarter is also displayed, prominently to boot!

The information is, of course, useful in planning new or fine-tuning current tactics and strategies. This is another area where players should look at nothing more than the data pertinent to their own firm.

During the parameter selection mode (setting prices and production levels), changes can be made by simply returning the player's alter ego to the correct building. Nothing is irreversible until the turn is relinquished.

A normal simulation runs for eight quarters, though users can select from one to 20. Once adept at selection entry, the quarters fly by.

Any stock held at the end of the scenario is sold at 50% of cost; therefore, inventories should be pared to a minimum as the game winds down. Not many businesses can take such a bath and remain profitable.

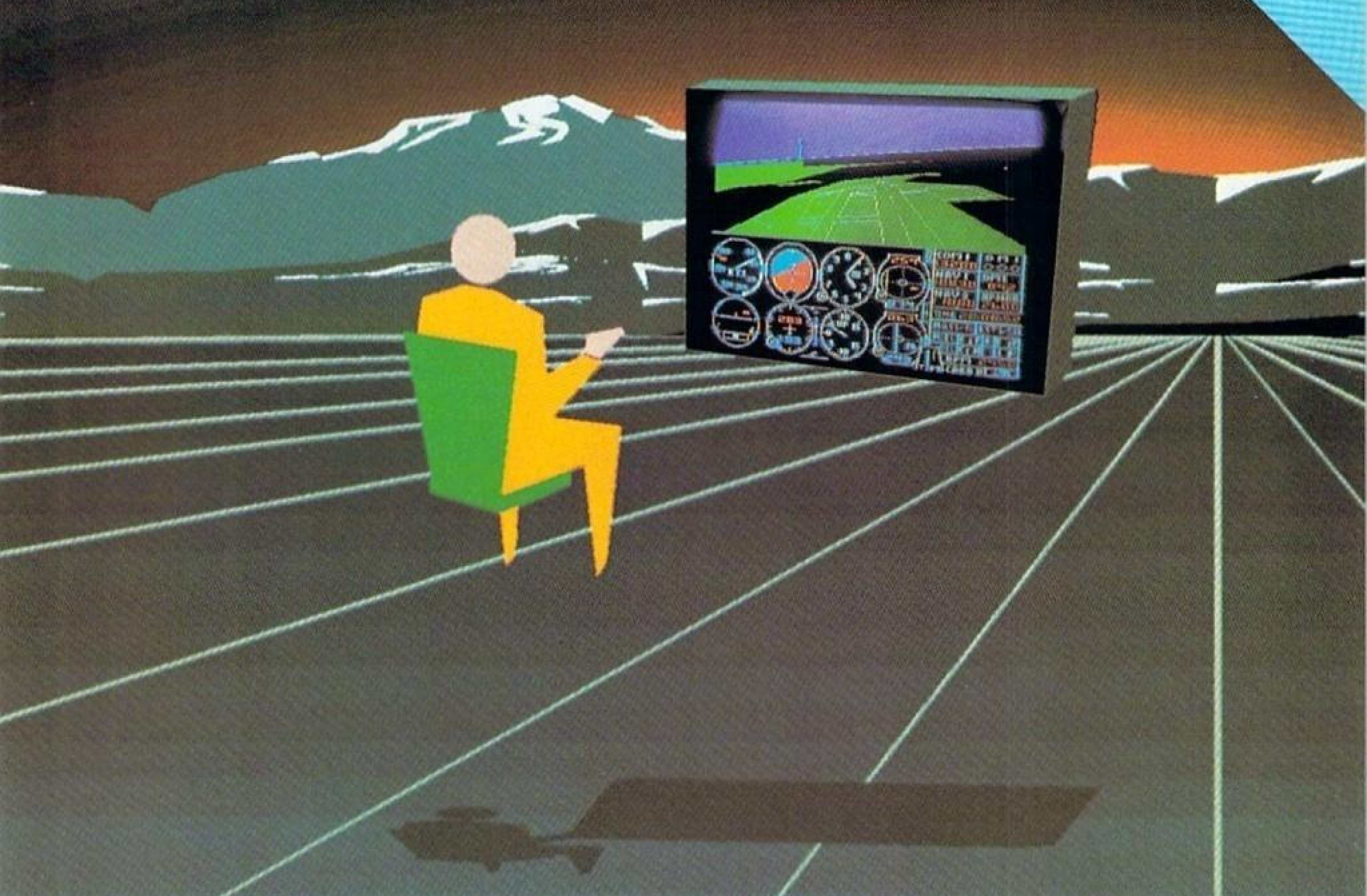
Anyone finishing in the black is a winner, though the one with the highest profit can claim a greater glory.

Although there are some elements missing (the same or worse can be said for many highly rated textbooks), they are of a relatively minor sort.

In the Chips is a four-star program which teaches as it entertains. A bargain at twice the price, for sure. **C**

Flight Simulator II

For the Commodore 64™



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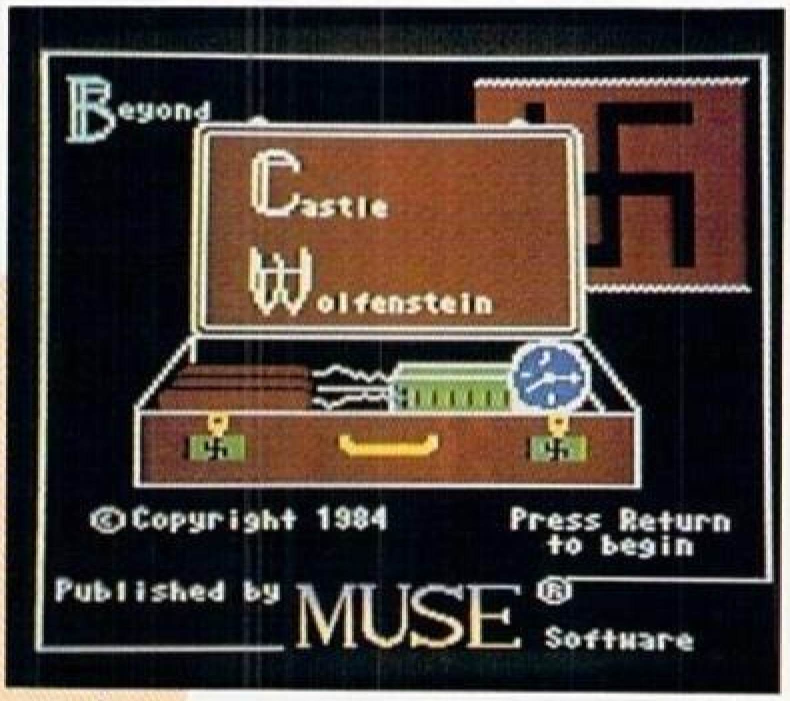
REVIEWED BY TED SALAMONE

Beyond Castle Wolfenstein



Computer: Commodore 64
Publisher: Muse
347 N. Charles Street
Baltimore, MD 21201
Medium: Disk

One good turn deserves another, at least that's the way the old adage goes. Evidently, the folks at Muse Software feel it's one saying worth living by. Their *Beyond Castle Wolfenstein,* sequel to the multiformatted, best-selling *Castle Wolfenstein,* is positive proof.

Basically a search and destroy game, *Beyond Castle Wolfenstein* has gamers roaming about a bunker, avoiding detection while searching for a previously planted briefcase bomb which must be moved to Hitler's conference room. This couldn't be any more lifelike, as it is a computerized version of the actual World War II assassination attempt which occurred at Regensburg after the tide of battle had shifted against the Nazis.

The new title is more inventive, more challenging and more interesting than the original and that's no mean feat. After all, *Castle Wolfenstein* didn't become popular because it was a poor game.

Beyond Castle Wolfenstein plays, looks and talks pretty much like its predecessor. That's right, Muse has injected a gutteral German into this one too. Though the vocabulary won't fill a dictionary, it does add a good dose of realism to the scenario.

Sparse graphics (by today's full palette layout) depict walls, doors, troops, the gamer's alter ego and De Fuhrer. Detail and animation are both improved.

A joystick plugged into port number two handles directional movement. When used in conjunction with a depressed firebutton, the controller can aim a weapon.

This is fine for flight or intimidation, but what happens when the shooting starts? Survival warrants that gamers hit the left arrow (non-cursor) key to fire a weapon. This can be tricky at times, though it becomes less so once several rounds are squeezed off.

> *The game plays, looks and talks pretty much like its predecessor,* Castle Wolfenstein. *But the new title is more inventive, more challenging and more interesting than the original —no mean feat.*

The keyboard can also be used for directional movement of the brave POW-turned-resistance fighter. As a matter of fact, key entries turn out to be rather indispensable, since many are used to accomplish specific tasks vital to completion of the mission.

Through these inputs, it is possible to holster the pistol, switch to a dagger (if found), retrieve and reset the bomb meant for Adolf and make use of the contents of an open closet.

One hundred marks are available for bribing guards when the forged passes don't work. Keys, tools and first-aid kits are also available.

Any dead guards should be dragged out of sight to lower the chances of an alarm being sounded. This capability is so outrageous, it's worth plugging a few extra SS types just to drag them around the nooks and crannies of the bunker.

Departed guards can also be searched for money, keys and extra ammunition, though the latter should only be taken if it's greater than that already in the gun. (Must be a fascist plot to make the game more difficult.)

Beyond Castle Wolfenstein, due to its extensive nature, has a save game option which is easily implemented through the RUN/STOP or CTRL-C keys. Another disk is not needed for this procedure.

Upon restart, the options menu shows the skill level and the following choices: new game with bunker at current level, new game with new bunker at level one, new game with same bunker and resume game in progress.

This mix and match approach allows for a fresh start in a familiar bunker as well as a totally new beginning in a previously ungenerated matrix. Selection is nothing more than a matter of personal preference.

Every time a new game is started, the briefing must be endured. Life would be simpler and loading time much shorter if there was a way to bypass or eliminate these screens. After all, how many times can you read the same story over and over again without being bored to tears?

Playing *Beyond Castle Wolfenstein* takes time and perseverance. Death can come quickly, so save the game often. The use of combination locks is a nice touch, but even more interesting are the riveting, savage screams as the mortally-wounded German troops fall.

Overall, *Beyond Castle Wolfenstein* is very entertaining and challenging, so join the underground and become a hero. Only this time, do it the safe way: play *Beyond Castle Wolfenstein.* By the way, don't forget your German dictionary; the natives treat you better when you speak their tongue. **C**

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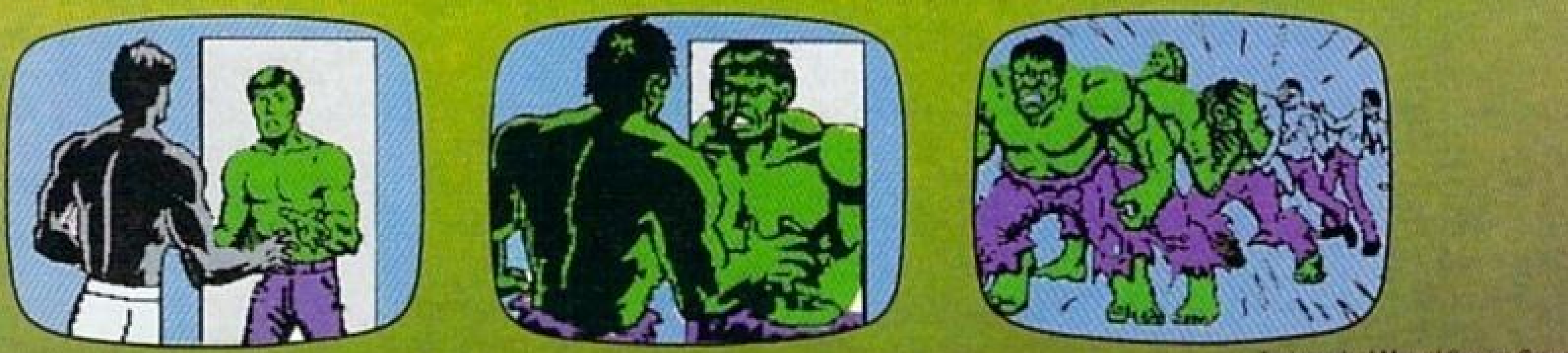

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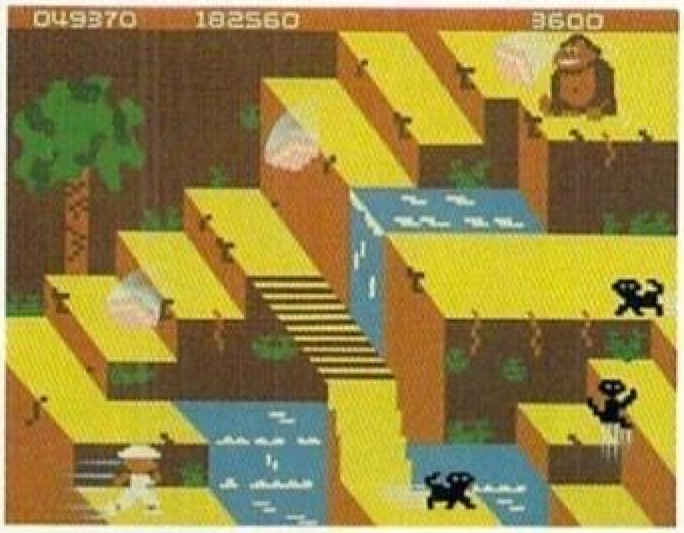
REVIEWED BY TED SALAMONE

Congo Bongo

Computer: Commodore 64
Publisher: Sega Enterprises, Inc.
360 N. Sepulveda Blvd.
El Segundo, CA 90245
Medium: Tape

> *This version is one of the best* Congo Bongo *arcade-to-home translations on the market, with rich graphics.*



I've just returned from a lush, tropical rain forest where the scenery was nothing short of breathtaking. The land was one of roaring waterfalls, high cliffs, deep blue waters and beautiful palms. The rich brown earth appeared as fertile as the Nile Valley.

The wildlife was even more stimulating. Silly simians scampered about doing their best to deter me from my goal: getting even with the mighty ape Congo Bongo. Seems he has no respect for tourists sleeping in tents; he gave me a hotfoot to prove it!

As the safari pressed on, other magnificent fauna appeared. Taxi terrapins and previously unknown, almost prehistoric, fish made their home in the Great River. Even the rare grey-white rhino charged about below the final hiding place of the insidious one. I vowed to scale the treacherous slopes and master the perilous crossings no matter what the cost. I would have my revenge.

This action-packed adventure was mine for less than airfare to Africa. Thanks to Sega, would-be Jungle Jims can explore far away places while staying right at home by playing *Congo Bongo*.

This version is one of the best *Congo Bongo* arcade-to-home translations on the market. Good use was made of the 64's superb capabilities in bringing the rich, almost sensuous colors and simulated three-dimensional layout to the masses.

The simple, rhythmic beat is still jaunty fun, though it sounds a bit tinny at times. Probably the biggest omission is the coin-op's angled playfield perspective a la *Zaxxon*. Fortunately, neither of these lapses seriously impairs playability.

As with most arcade-style games, the object is to amass as many points as possible while executing a particular play. In this case, gamers must manage a variation on the climbing/jumping routines standardized by *Donkey Kong* and *Miner 2049'er*. Just goes to show that a little bit of fresh air never hurt anyone!

One or two adventurers can play by alternating control of their onscreen surrogate. A joystick plugged into port number two allows the video 'venger to walk or climb, depressing the firebutton makes him jump.

Keyboard control is also possible, though it's about as practical as trying to tie your shoelaces while driving a car down a mountain road at 80 miles an hour.

In the first screen, titled Jungle Mountain, explorers must attempt to reach Congo Bongo by traveling from the lower left to his perch uppermost on the right.

The coffee bean-like coconuts he throws are deadly. Falling off a ledge or taking a swim also eliminates one of the three lives players begin with. Maneuvering or avoiding the hurtling, hard-shelled nut isn't easy due to the three-dimensional graphics.

Next, players must jump a chasm whose cliff promptly collapses into the waters far below, thereby eliminating any idea of turning back. Here, Monkey Plateau rises. On it, the simians hop on the pixel player's back, preventing further mobility. Only by hopping up and down three times in quick succession can they be dislodged. In higher levels, it is even possible for the chimps to toss you over the edge. (Guess they don't work for Tarzan.)

Oddly enough, dying is one of the game's more visually entertaining occurrences. The gamer's persona folds his hands as in prayer and sprouts wings and a halo as he ascends to that great video parlor in the sky.

After successfully outwitting the monkeys, joystick jockeys must leap a river and dodge more nuts while climbing to Congo's resting place. Getting there produces the second screen, as Congo Bongo flees to his jungle redoubt.

The Great River's lagoon has to be crossed next. Hopping from lilypad to turtles, islands and fish, the brave hunter makes his way to dry land below the sleeping ape. Naturally, it's not an afternoon stroll in the park.

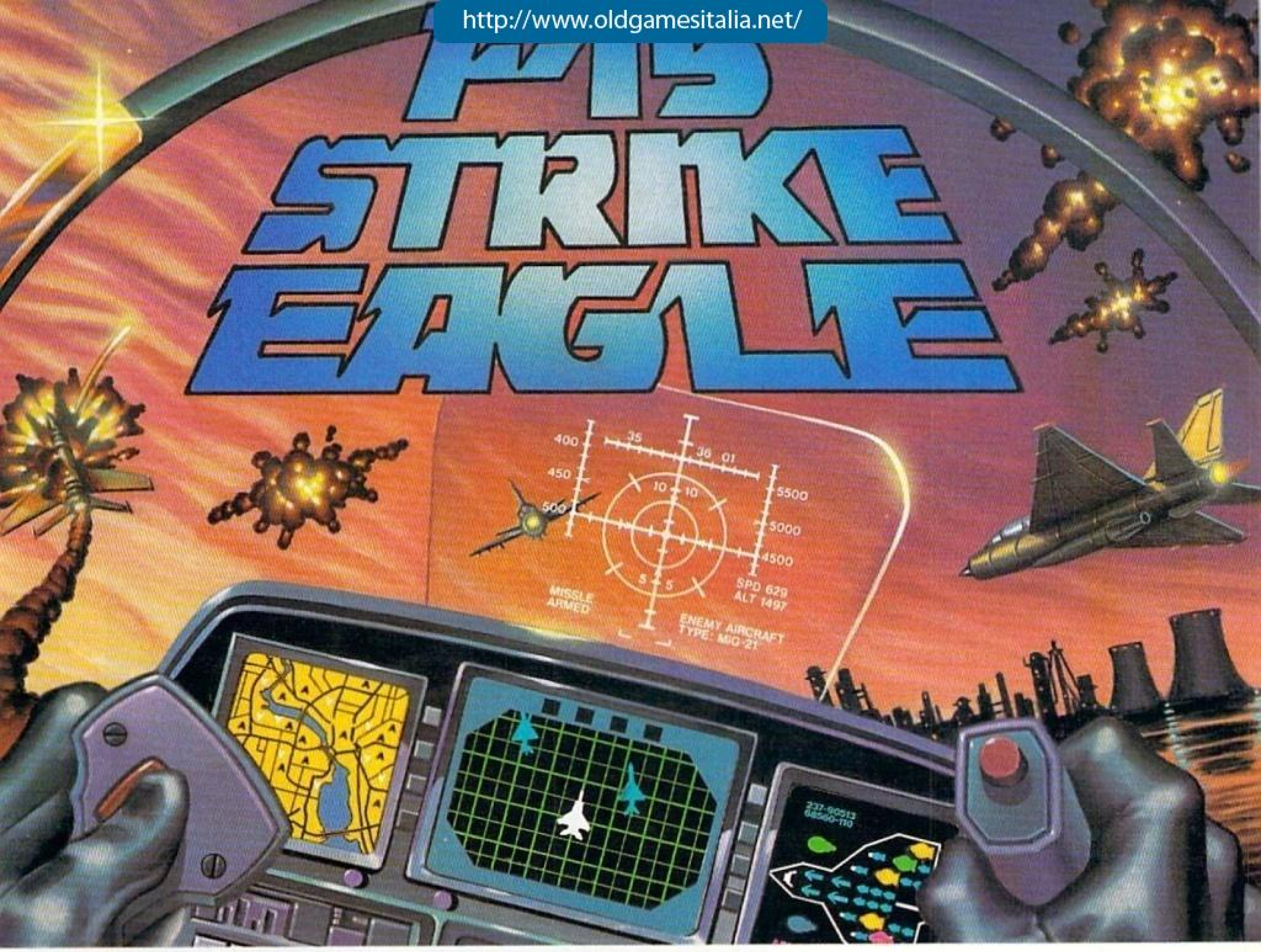
Lilypads exhibit the nasty habit of shrinking and re-enlarging as they waft across the waves. The fish (starting with the third level) snap their mouths open and closed in a lethal manner. The turtles just travel to and fro, though hopping onto them (as well as anything else) requires skill, timing and a good idea of what spots are actually safe.

Falling from any of these precarious perches (need I say) is not healthy. One other danger, present on both screens, is the dreaded timer. If it runs out, so do you. On the other hand, beating the clock earns a hefty screen completion bonus for the Mercury's amongst us.

Once across the Great (Wet) Divide, look out for the runaway rhino. A quick hop to the next ledge eliminates this danger while putting the archenemy within a match distance. Oh, how sweet it is!

From here, *Congo Bongo* plays the same screens indefinitely, though the action becomes progressively more difficult with each level attained.

Player orientation takes a while. The spatial relationships of the objects can be hard to determine at first. Don't let this frustrate you, for making the leaps, riding the terps and heating up the big bully are tremendously satisfying accomplishments. Though rewarding, the whole shooting match doesn't happen often without a lot of practice. *Congo Bongo* is one challenging piece of software. **C**



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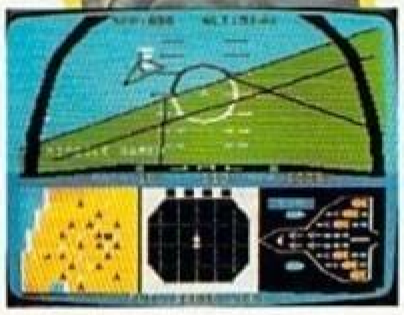

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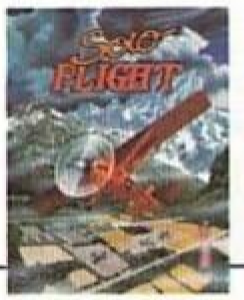

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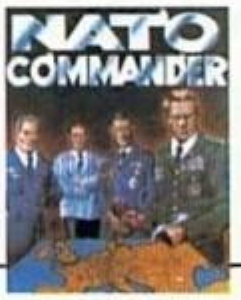

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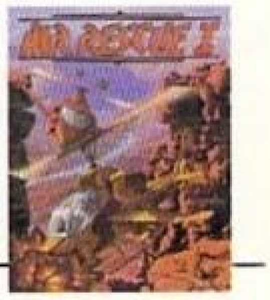

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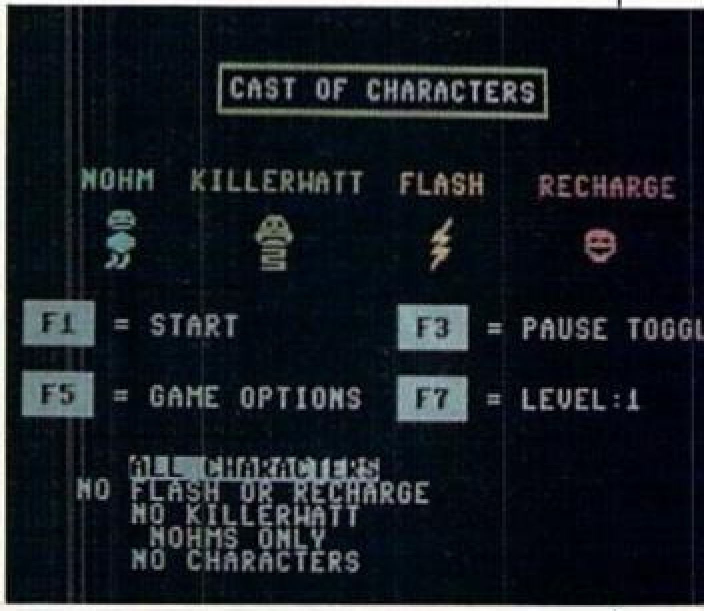
GAME REVIEWS

REVIEWED BY PETER DEAL

Juice!

Computer: Commodore 64
Publisher: Tronix
8295 South Cienega Blvd.
Inglewood, CA 90301
Medium: Disk/Tape



CAST OF CHARACTERS

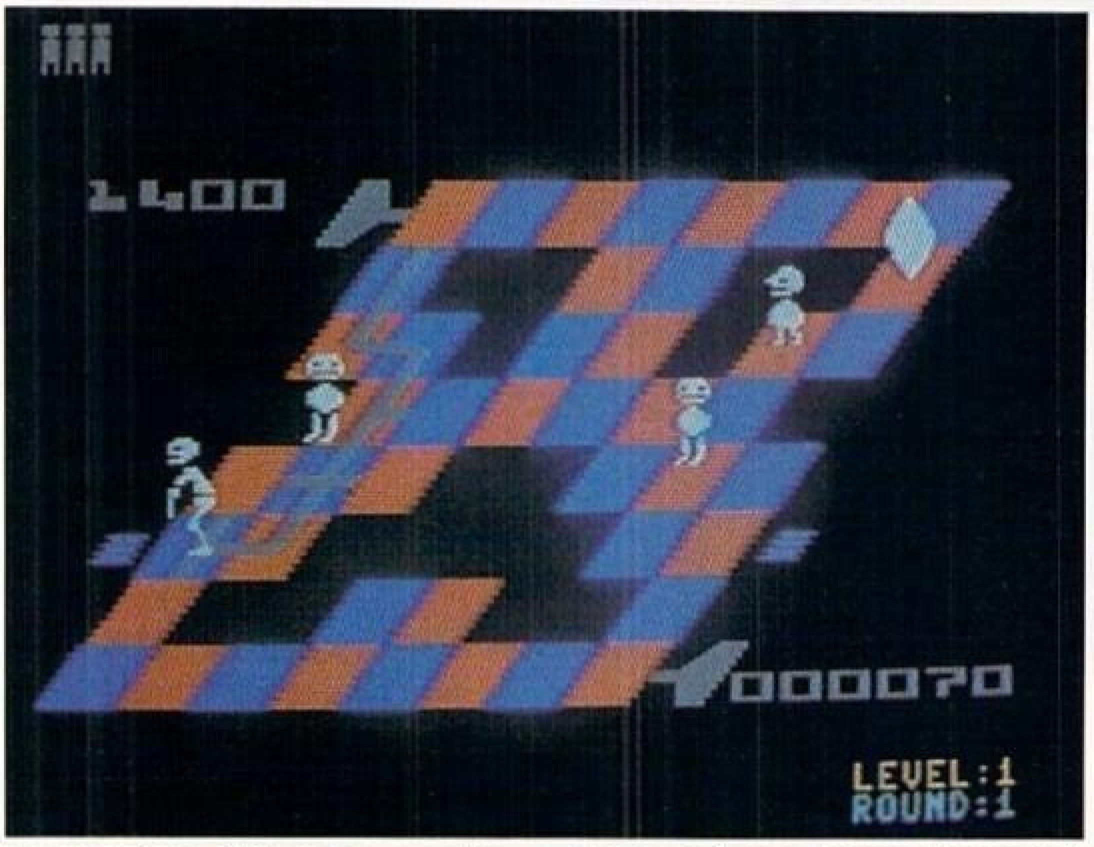
NOHM KILLERWATT FLASH RECHARGE

F1 = START F3 = PAUSE TOGGL

F5 = GAME OPTIONS F7 = LEVEL:1

ALL CHARACTERS
NO FLASH OR RECHARGE
NO KILLERWATT
NOHMS ONLY
NO CHARACTERS

Juice! is a very simple game. You are Edison and your job is to connect circuit boards as quickly as possible. But there is one catch. Well, four, really. The circuit boards not only get more and more complicated, but there are nohms. Nohms bounce from here to there and then leave, but they always come back. And they leave a capacitor which changes into a Killerwatt, who bounces around like the nohms, only after you. He doesn't leave until you trick him and make him fall off the circuit board. And there is Flash, a Lightning Dolt, who disconnects parts of the circuit as he bounces.



All that and more. If Edison bumps into a nohm, Killerwatt or Flash, he melts down on the spot. And on the harder levels, if Edison bounces onto part of a circuit that he already connected, it will disconnect.

But have no fear, for Recharge is here! Recharge is Edison's friend. If you bump into Recharge, great things happen (that I won't tell you about).

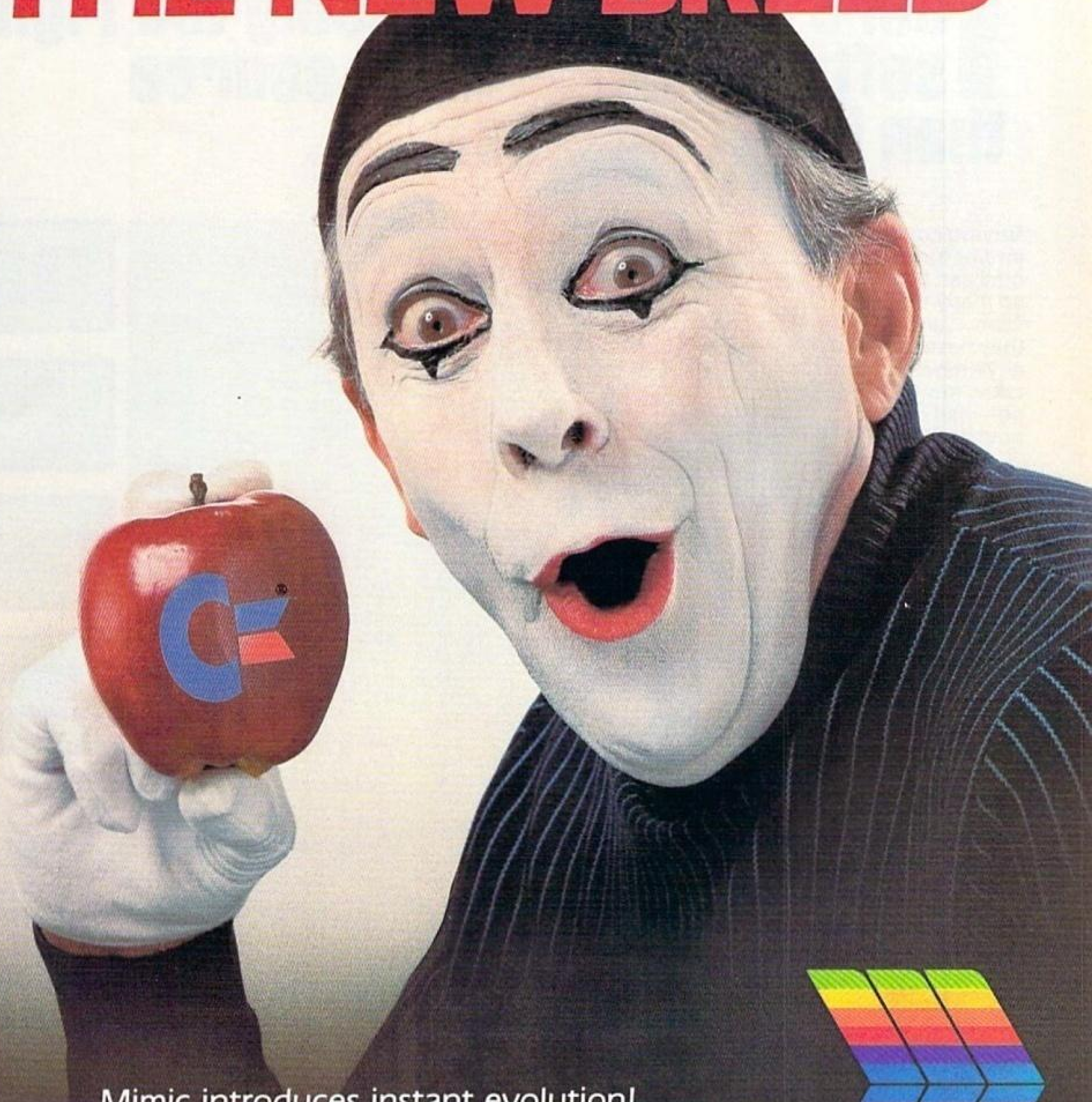
Juice! reminds me of *Q*bert* in the sense that they both have three-dimensional screens. The opening title impressed me, but, unfortunately, it doesn't stay on very long. The graphics for the rest of the game are very good, except for the fact that all the characters are white (bleah!). If Edison melts down, he sinks into the circuit as if he were sinking into water.

In the earlier levels of *Juice!*, there isn't much challenge. But when you get to the harder levels, there is too much challenge. For instance, you have to step on parts of the circuit two times to connect it. Or, on the really hard levels, you have to avoid stepping on a part of the circuit that you already stepped on or it will disconnect.

The instructions are clear and tell you just about everything you need to know about the game.

Juice! is fun to play. But, if you are going to buy *Juice!*, heed my warning: I said it was simple. I didn't say it was easy. **C**

THE NEW BREED



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If you use your personal computer to keep track of mortgage payments, tuition payments, balance your checkbook or jump ahead of the Dow Jones', there's good news for you. You'll find that the new OKIMATE 10 gets down to business quickly. And easily.

A "Learn-to-Print" diskette and tape shows you how to set up your new personal color printer and start printing. A complete OKIMATE 10 Handbook will show you how you can take your imagination to places it's never been before.

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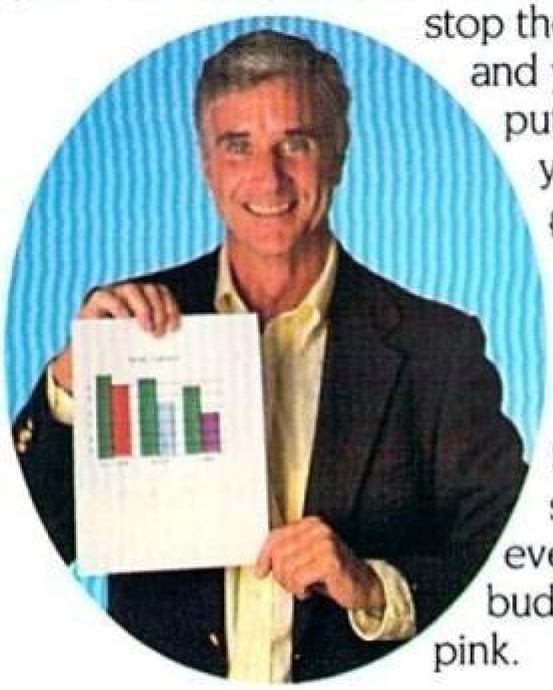
And while your imagination is soaring, you'll be glad to know that your new printer can keep right up with it! The new OKIMATE 10 is built with the same tradition of quality and manufacturing excellence that has made Okidata the most respected name in computer printers. Okidata craftsmen specially designed and engineered the new OKIMATE 10 to be incredibly small and lightweight. And they made it quiet as a whisper. But their imagination didn't stop there. To help you and your personal computer keep within your personal budget, they made the OKIMATE 10 available at retailers everywhere for less than $250. Something that should make every personal budget tickled pink.



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If you've been playing games on your personal computer, now you can get serious and still have fun. The new OKIMATE 10 is completely compatible with a variety of software packages that will run on your Atari and Commodore with a simple disk drive. Just load and you're off and running. Plotting charts. Designing special graphs. Creating original illustrations and pictures. Drawing special graphics. And printing them all beautifully for everyone. On most kinds of paper. In over 26 beautiful colors!

QUESTIONS & ANSWERS

Q: Why do I need a printer?

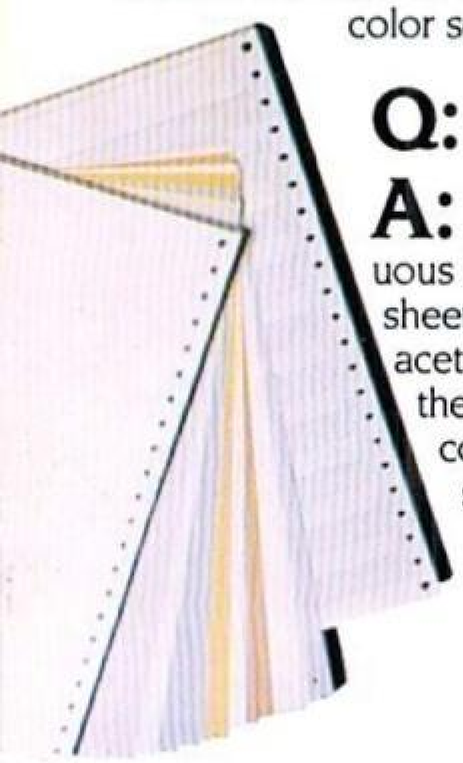
A: You might as well ask, "Why do I need crayons?" When it comes to communicating, "putting it on paper" is still the best way to get your message across. You can have lots of computer equipment, but without the OKIMATE 10, it doesn't mean very much. Unless you get your letter, report, term paper or party invitation off the screen and down on paper, nobody's going to see it.

Q: What makes the OKIMATE 10 better than any other printer?

A: Because the OKIMATE 10 is unlike any other printer. First, it prints in COLOR. Up to 26 beautiful colors. Second, it prints up to 240 words a minute, so quietly you can talk in a whisper right next to it and still hear every word! And third, it prints letter quality, every time.

Q: What about graphics and pictures?

A: The OKIMATE 10 does it all. Graphs, charts, symbols, pictures, illustrations, and special drawings! With a compatible drawing package, anything you create on your screen can be printed in full color; a disk drive is required for color screen printing.



Q: What kind of paper can I use?

A: Just about any kind of smooth paper you want. From continuous feed computer paper to single sheets. From mailing labels to plastic acetate for overhead transparencies, the OKIMATE 10 prints crisp, clean, colorful images you'll be proud to send to friends, teachers, business associates, or frame and hang right in your own living room!

Q: Is the OKIMATE 10 easy to use?

A: As easy as "PLUG 'N PRINT!" No other printer is easier to use than the OKIMATE 10. Connecting the printer to your Commodore or Atari computer is, literally, a snap. The exclusive PLUG 'N PRINT package snaps into the printer. One cable connects it directly to your computer or disk/tape drive. Turn it on and you're in business. Once your OKIMATE 10 is up and running, the "Learn-to-Print" software program (included) teaches you printer basics—the "Color Screen Print" disk (also included) automatically prints everything on the screen in a single stroke. As a matter of fact, most of your printing can be done with just one command.

Q: What's the printer like in operation?

A: In one word: easy! Incredibly easy! The ribbon comes in a "Clean Hands" cartridge. So it's as easy to change as the tape in your audio cassette player.

Q: What about reliability?

A: Okidata has built the reputation of its complete line of printers on quality, dependability and rugged construction. The OKIMATE 10 is no exception. Don't let its light weight and compact size fool you. This printer is not a toy. It's a workhorse.

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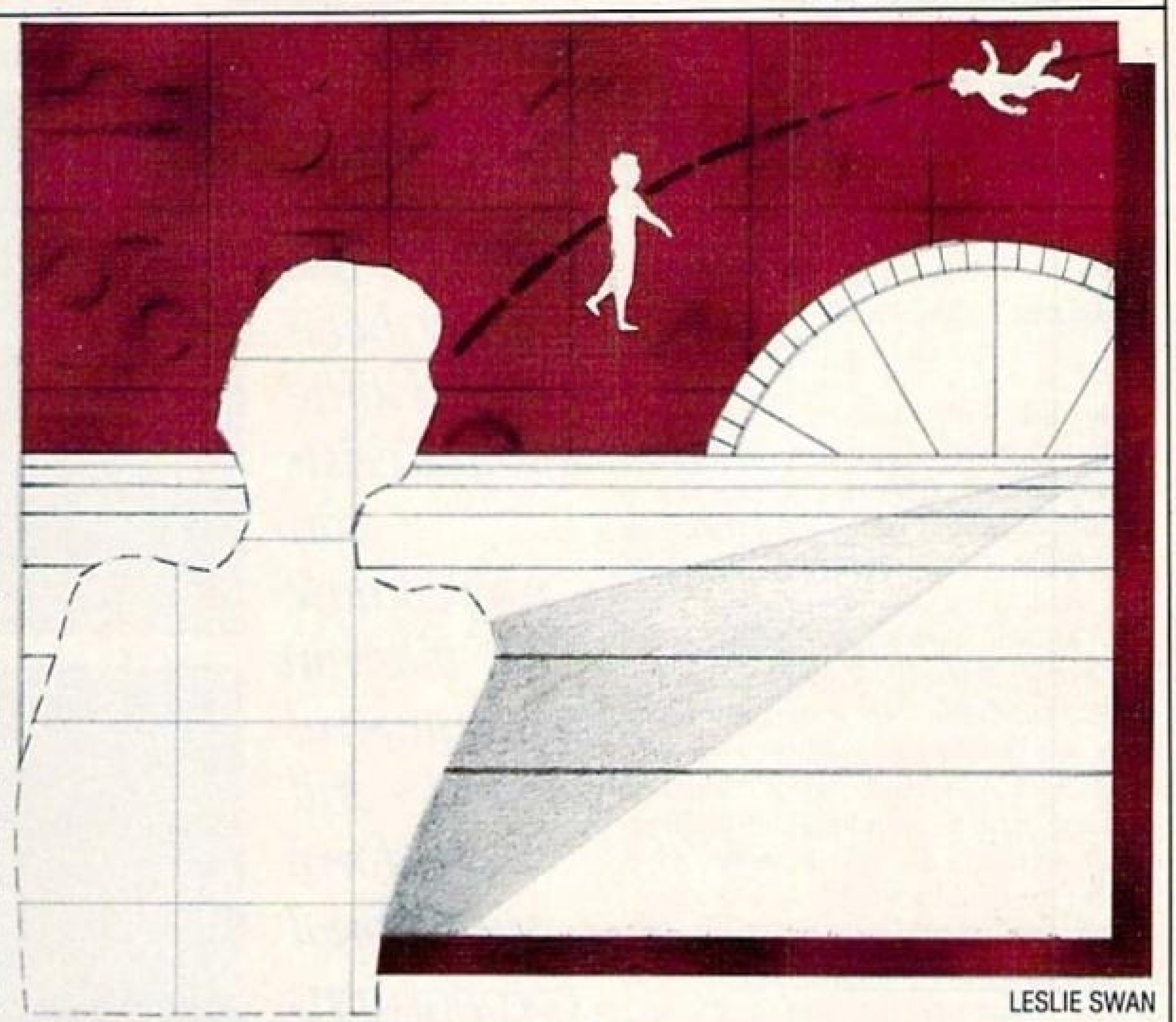
REVIEWED BY KELLEY ESSOE

Astro-Talk

Computer: Commodore 64
Publisher: Matrix
315 Marion
Big Rapids, MI 49307
Medium: Disk

The advent of the microcomputer in 1977 marked the beginning of a revolutionary phase in the growing resurgence of astrology. The speed and accuracy of computer-calculated charts suddenly allowed even the least mathematically-oriented astrologer instant access to the myriad of complex astrological methods and techniques. The hours it took to figure a complete natal chart could now be devoted to analysis and interpretation. Years of data compiling and sorting could now be accomplished in a mere day or two. At the touch of a key, an ancient and one-time highly respected science was inaugurated into its modern-day resurrection.



LESLIE SWAN

To have *Astro-Talk* calculate and interpret your natal chart, all you have to do is give your birth data: date, time and place. *Astro-Talk* provides three alternatives to entering birth information. The first is simply entering your date of birth, which would be, for example, 4-10-1948. Your second alternative is to enter your birth date and your time of birth. The last option is the complete birth data—date, time and place—the latter taking the form of geographical latitude and longitude. Of course, the more complete birth data you can give, the more accurate and detailed the chart interpretation will be.

Then just sit back and prepare for an absorbing look at yourself and your life as seen through the language of the stars. From your love life to your career skills, from your basic drives to your life challenges, from your inner self, intellect and imagination to your sense of independence and personal power, *Astro-Talk* will give you insight into just about every facet of your life.

As well as being your own live-in astrological counselor, *Astro-Talk* is also a patient and thorough teacher. The Student Astroguide portion of the program allows you to ask for the interpretation of any planetary sign, house position, aspect or Rising sign. And in both the Chart Interpretation and the Student Guide modes, you have the option of choosing the Tropical (equinox-oriented) or Sidereal (constellation-oriented) Zodiacs and whether you want the Geocentric (earth-centered) or Heliocentric (Sun-centered) planetary positions.

> Astro-Talk *is much more than just a computerized parlor game. It is an in-depth astrological interpretation program from the same people who provide a complete line for the professional astrologer.*

Push "H" for HELP and *Astro-Talk* will offer you instructions, information, a concise introduction to astrology or even tell you a little about Matrix and their line of professional astrological software.

Want a printout of what's on the screen? Push the "?" key and you'll have hard-copy proof that your Mercury/Mars opposition does not necessarily condemn you to a life of heated arguments . . . you may simply be a lawyer at heart!

The documentation for this program is superlative. It assumes nothing. From the clear-cut loading instructions through the step-by-step explanations of the different features and options available, one is never lost, never intimidated and never bored to tears. Those folks at Matrix even included a glossary of astrological terms, a listing of the latitudes and longitudes of major cities throughout the world and a marvelously laid out flowchart of the entire program which they call the Roadmap.

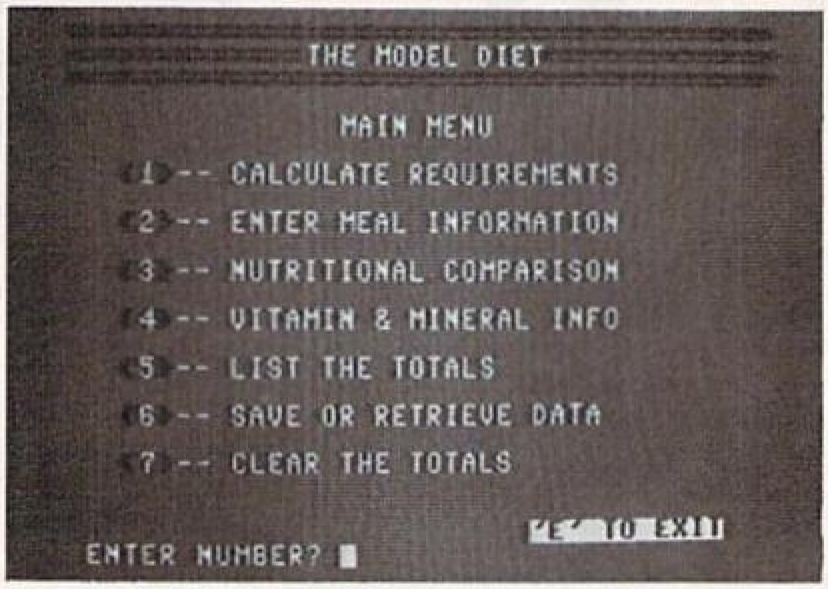
Astro-Talk is an adventure that shouldn't be missed. Whether your familiarity with astrology is above average or completely nonexistent makes no difference. You need no passport, no intensive training and no specialized expertise to go on this cosmic voyage. *Astro-Talk* does not take you on a journey into the deep regions of outer space . . . but rather opens the doors for an exciting exploration into that often mystifying and always fascinating realm of inner space . . . yourself. C

REVIEWED BY TED SALAMONE

Model Diet

Computer: Commodore 64
Publisher: Softsync
14 E. 34th Street
New York, NY 10016
Medium: Disk/Tape

With Model Diet, *good health has never been easier! Home computerists can manipulate vitamin and mineral intake and perform nutritional comparisons with just a few keystrokes.*



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THE MODEL DIET

MAIN MENU

<1>-- CALCULATE REQUIREMENTS
<2>-- ENTER MEAL INFORMATION
<3>-- NUTRITIONAL COMPARISON
<4>-- VITAMIN & MINERAL INFO
<5>-- LIST THE TOTALS
<6>-- SAVE OR RETRIEVE DATA
<7>-- CLEAR THE TOTALS

                          'E' TO EXIT
ENTER NUMBER? █
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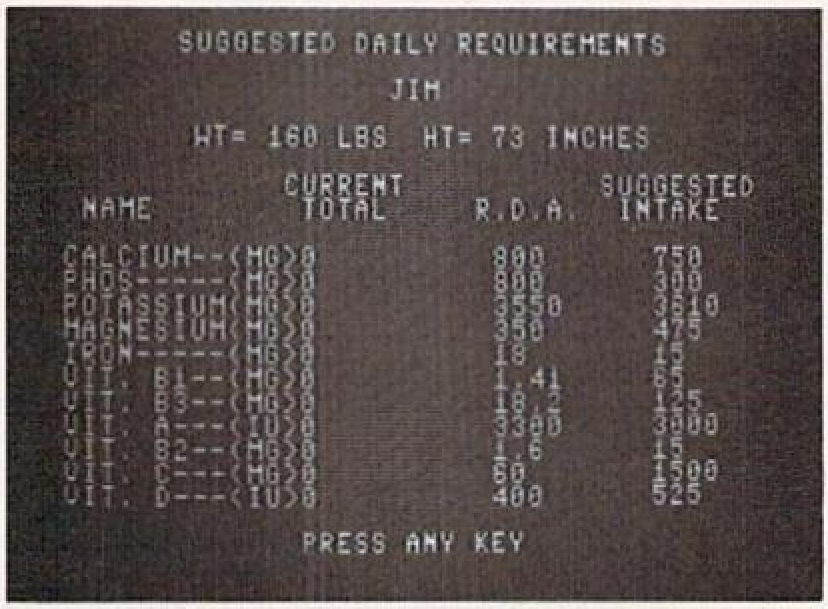

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      SUGGESTED DAILY REQUIREMENTS
                  JIM
      WT= 160 LBS  HT= 73 INCHES
              CURRENT            SUGGESTED
 NAME          TOTAL     R.D.A.   INTAKE
CALCIUM--(MG)0           800      750
PHOS-----(MG)0           800      300
POTASSIUM(MG)0           3550     3610
MAGNESIUM(MG)0           350      475
IRON-----(MG)0           18       15
VIT. B1--(MG)0           1.41     65
VIT. B3--(MG)0           18.2     125
VIT. A---(IU)0           3300     3000
VIT. B2--(MG)0           1.6      15
VIT. C---(MG)0           60       1500
VIT. D---(IU)0           400      525
              PRESS ANY KEY
```

Packed with close to 2,000 food items (generic and brand names) categorized under 16 separate headings, *Model Diet's* food library is amazingly comprehensive. Some of the categories include milk items, fruit juices, beverages, soups, fast foods, egg dishes, vegetables, meats, cheese products, fish and grain products. Cakes/candy, salads, cereals, fruits and a seldom used "build it yourself" class complete the listings, all of which can be dumped to a printer for easy referral.

The last heading permits users to build a file from scratch, though this means assigning portion sizes and nutritional statistics. Actually, most meals can be analyzed and broken down so that they accurately fit the preprogrammed classifications.

Within each category, there are also subtypes. Grapefruit juice can be fresh or canned; cheese can be Cheddar or Swiss; cereal can be Total or Wheaties. Just checking out the brand names provides an interesting insight into what we Americans consume on a regular basis.

After user specific data has been entered (eating habits, health condition, age, sex, degree of salt usage and the like), the program displays your actual weight (self-supplied of course) and recommended weight based on the previous input.

If overweight, *Model Diet* shows you how long it will take to lose weight by reducing caloric intake in steps ranging from 100 to 700 units per day.

Keying in a day's food intake and saving it to compare to a prior total creates a comprehensive history useful for meeting long range goals. This option can be waived if nutritional information about particular foods is all that's required. The choice is yours.

Amount eaten (in ounces) is a required parameter. If unsure of this figure, the computer will do its calculations based upon the breakdown of an average portion.

Beyond the dieting and historical uses already mentioned, *Model Diet* provides a definitive analysis of everything eaten, imbibed or otherwise ingested. This personal food file can be compared to the RDA or against individual needs as determined by the entries at startup.

The output can be most revealing, especially in regards to the recurring inadequacy of the RDA as a true yardstick of an individual's well-being.

Upon completion of the diet analysis, a comparison chart is portrayed onscreen. It is a very striking, easy to understand way of getting a message across. Relative percentages of numerous vitamins (A, B1, B2, B3, C and D) and minerals (iron, magnesium, potassium, phosphorous, calcium and protein) are depicted.

The next screen shows the figures the previous graph is based upon. Working from this, the program leads to the Vita(min)eral section.

Here, a short summary of these essential ingredients is provided for educational and nutritional purposes. The need for each, the foods which provide it in abundance and the toxic levels (if any) are listed. There is also a rundown on symptoms or illnesses produced by deficiencies.

All data can be stored to and retrieved from disk or cassette by following a few simple onscreen prompts. At all times, the video instructions are clear and concise, likewise the written documentation.

Model Diet allows 64 owners to create individualized nutritional need files, historical databases and to compare actual versus optimum intake. The informational aspect educates users about the ingredients necessary for a better life and the calorie counter/weight reduction routine can augment or supplant other dietary plans.

Using the *Model Diet* shows that it is much more than a weight loss memopad. Faithful and intelligent use can make a healthier, happier person out of someone you can't live without . . . yourself! C

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REVIEWED BY TED SALAMONE

S.A.M.

Computer: Commodore 64
Publisher: Tronix Publishing
8295 South La Cienega Blvd.
Inglewood, CA 90301
Medium: Disk/Tape

Utility packages are most effectively graded on two broad categories: ease of use (accessibility) and capability. The former is important because the best tools in the world are no good to those who can't use them and the latter because useless implements are just a waste of time, money and effort. Today, who can afford to throw all that away?

Fortunately for Commodore 64 users, Tronix's *S.A.M. (Software Automatic Mouth)* passes muster on both counts. It provides excellent speech synthesis without needing expensive peripherals.

Aimed primarily at hobbyists and programmers (BASIC or machine language), *S.A.M.* can also serve educationally by illustrating the deductive nature of pronunciation, enunciation and overall verbal communication. Just learning the fundamentals of phonetic spelling is absorbing and quite informative.

S.A.M. is actually composed of several separate programs. Some work in conjunction with others and a few stand alone. Loading SAM itself (the speech synthesis program) also loads KNOBS (a fine tuner) and the SAM Wedge, a utility program which enhances the builtin BASIC with ten additional commands.

Beyond these complementary routines, it is possible to load DEMO (self-explanatory I would say) or load and use SAYIT (a BASIC program allowing immediate mode input/output.) SPEECHES (a compilation of familiar orations), GUESSNUM (wonder what this could be?) and RECITER (an English text-to-speech routine) complete the package. Whew, seems like a lot! Well, it is, but it's also very, very easy to use.

All the speech generating commands in the SAM Wedge can be used in either immediate execution or deferred (programming) modes. For sophisticated hackers creating a large program, requiring expedited execution or using a non-standard wedge program, SAM can be accessed directly from any point in a BASIC or machine language program. A two-line BASIC subroutine comprised of a reserved string variable and the SYS command will do the job. Monitor maniacs must do the string handling manually, but no doubt they'll enjoy it!

SAM (which occupies about 11K RAM) can be loaded with the high memory pointer reset to minimize memory usage, while the RECITER routine can be loaded (onscreen prompts alert users of the choice) into either low or high memory.

Now let's return from the heights of esoterica to a broader plane of understanding. The most important new command is SAY, which makes the computer speak its piece whether the input is a string variable, phoneme or English string in either mode of execution.

> An introduction to phonetic spelling is included for those who think phoneme is a typo for "phone me."

PITCH and SPEED can be set for values ranging from 0 to 255, though the extremes are not recommended. LIGHT toggles the screen display on or off. When left on, SAM growls a bit no matter what the parameters are set at. A cleaner sound is produced when no images are displayed.

The SAM command activates phonetic acceptance while the RECITER command switches to the English input mode. KNOBS permits voice changes through alteration of the size of SAM's throat and mouth. Naturally this is only symbolic!

LOAD is used to enter the RECITER program in the 64's RAM; ERROR alerts coders to phoneme spelling mistakes. This last function is invaluable!

The QUIT command merely eliminates the SAM Wedge from memory. For convenience, every command can be abbreviated to three keystrokes.

An introduction to phonetic spelling is included for those who thought phoneme was a typo for "phone me" scribbled on a sweetheart's algebra book.

A list of English phonemes is included with a word depicting the sound of each. Additionally, a 1,500 word English-to-Phoneme dictionary covers common and difficult words as well as units of measure, days of the week, the months, numbers, U.S. states and Canadian provinces.

In case the word you're looking for isn't included, a short but comprehensive tutorial outlines the procedure for converting any word to phonetic spelling.

Punctuation such as the hyphen, period, comma and question mark serve to mark boundaries. Hyphens insert short pauses; commas produce one about twice as long. Periods end a sentence with falling pitch while question marks cause the pitch to rise. It's all very natural sounding.

Inflection and emphasis convey a tremendous amount of meaning in the English (or any) language. Without these subtle intonations, the power of speech would be greatly reduced. So would the effectiveness of SAM.

Fortunately, it is capable of unlimited inflection and emphasis. Stress markers (the numbers of one to eight inclusive) can be placed after the vowel to be emphasized. Though it may look funny to see hello spelled "/HEH3LOW" (level three emphasis on the first syllable), the system is straightforward and well-documented.

A brief memory address table, detailed information about *S.A.M.* and the evolution of unlimited vocabulary speech synthesizers wrap up the instruction booklet. Kudos go to the documentation writers for producing a well-organized, clear, concise and fact-filled manual.

In use, *S.A.M.* is reliable, flexible and more fun than a utility package has a right to be.

Besides being a first rate, user friendly program (45 minutes after boot I had a decent program up and running), it is truly a brilliant conversationalist.

As *S.A.M.* would say, "IHTS SOW4 SIH4MPUL". **C**

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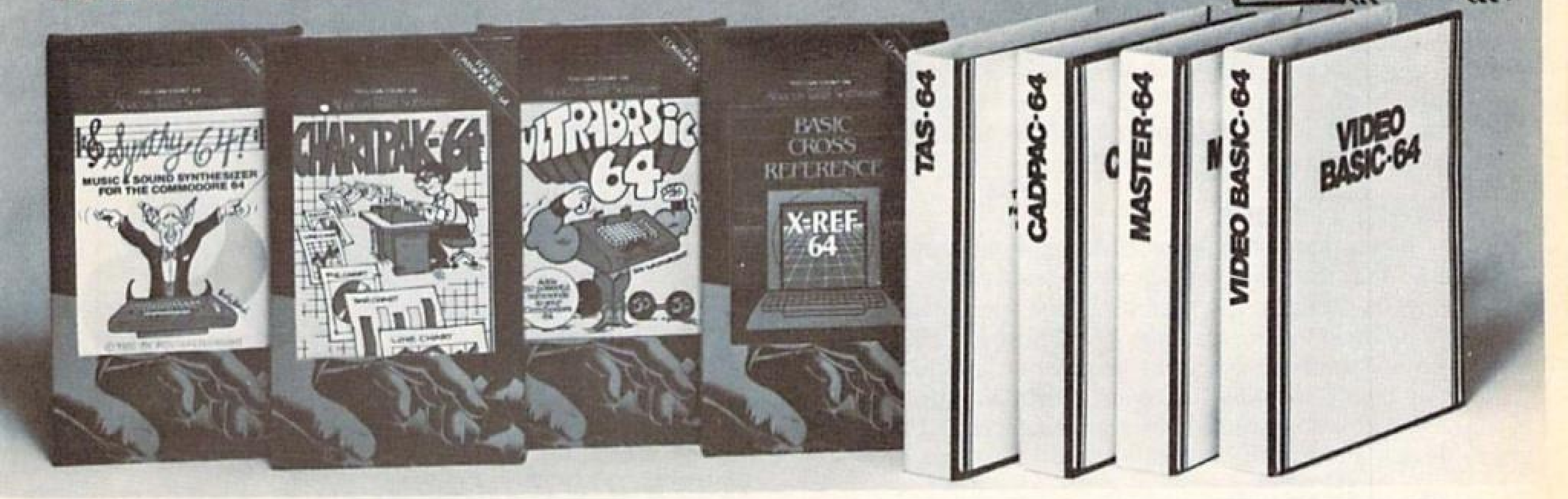

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Circle Reader Service No. 23

BY DONALD J. EDDINGTON

A VIC 20 Christmas

The music is playing—sounding songs of Christmas—and the screen is aglow with flashing colorful lights. Tune after tune plays—seven in all—and then the concert begins again. The source? Your VIC 20 computer, running this all-BASIC program. Have a sing-along and let the VIC lead it for you!

What it Does

As you listen to the songs this program plays, you will find that they use two voices very effectively. Different speeds (tempos) are used and each song changes keys (tonalities) for best results. The transition from tune to tune is made smoother by using short interludes. What you hear is a medley of seven Christmas songs—a medley that will surprise even the accomplished musician. Run it and hear for yourself!

How it Works

The notes are stored in an array. Two tune strings are read from data. The position counter is set to one. The first character of each tune string is extracted using the MID$ function. This character will set the tempo of the tune. Then, the program loops back to line 100 and the position counter is incremented by one.

The next character of each tune string is now extracted (using MID$). Now, the ASCII code of this character is found and 59 subtracted from the result. The note array is referenced at the number just calculated and the note value found there is poked into the proper voice. A color ball is poked to a random color and position on the screen and the note is held for the tempo set earlier. Then, the program loops between line 100 and line 180 until the position counter exceeds the length of either tune string. At this point, the program counter is reset to one and the whole process starts over with line 60.

The result: a VIC 20 Christmas with flashing lights and Christmas carols playing for you!!

Merry Christmas to all, and to everyone a tuneful New Year. Run this VIC 20 program today and listen to these tunes of Christmas good cheer!

Line-By-Line Trace

5.	REM author and title of program.
10. and 12.	PRINTed on the screen.
15. and 20.	Note array values.
25.	Clear all sound registers.
30.	Dimension note array.
40.	READ note values into note array.
50.	Set volume—moderately loud.
60.	READ two tune strings.
70.	Check for start-over value.
80.	Set position counter to value of one.
100.	If the position counter value is greater than the length of the tune string, then READ another tune string.
110.	Set N to the ASCII code of the character found at position P in the A$, then subtract 59 from this value.
111 to 113.	Negative values of N will set tempos for tunes.
115.	Pick a random screen position and a random color.
125.	POKE a color ball onto the screen—random position and color.
130.	Set G to the value found at position N of the Z% (notes) array.
140.	Set N to the ASCII code of the character found at position P in the B$, then subtract 59 from this value.
150.	Set H to the value found at position N of the Z% (notes) array. Add one to the position counter.
170.	POKE the G value into the high voice; POKE the H value into the middle voice.
180.	Hold notes for tempo setting T, then loop back to line 100 for more notes.
190.	Start program over: wait one second, then reset the data pointers to top of data (with RESTORE).
1000 to 1300.	All tune strings which play the seven Christmas carols in two-voice style. C

VIC 20 Christmas

```
5 REM VIC 20 CHRISTMAS BY D.J.
  EDDINGTON
10 PRINT"[CLEAR,BLUE,SPACE2]
   A VIC 20 CHRISTMAS[SPACE4,DOWN,
   WHITE]BY D.J. EDDINGTON"
12 PRINT"[RED,DOWN,SPACE2]MERRY
   [SPACE3]CHRISTMAS!!"
15 DATA 0,163,175,183,187,191,195,199,
   201,203,207,209,212,215,217,219,
   221,223
```

Continued on pg. 44

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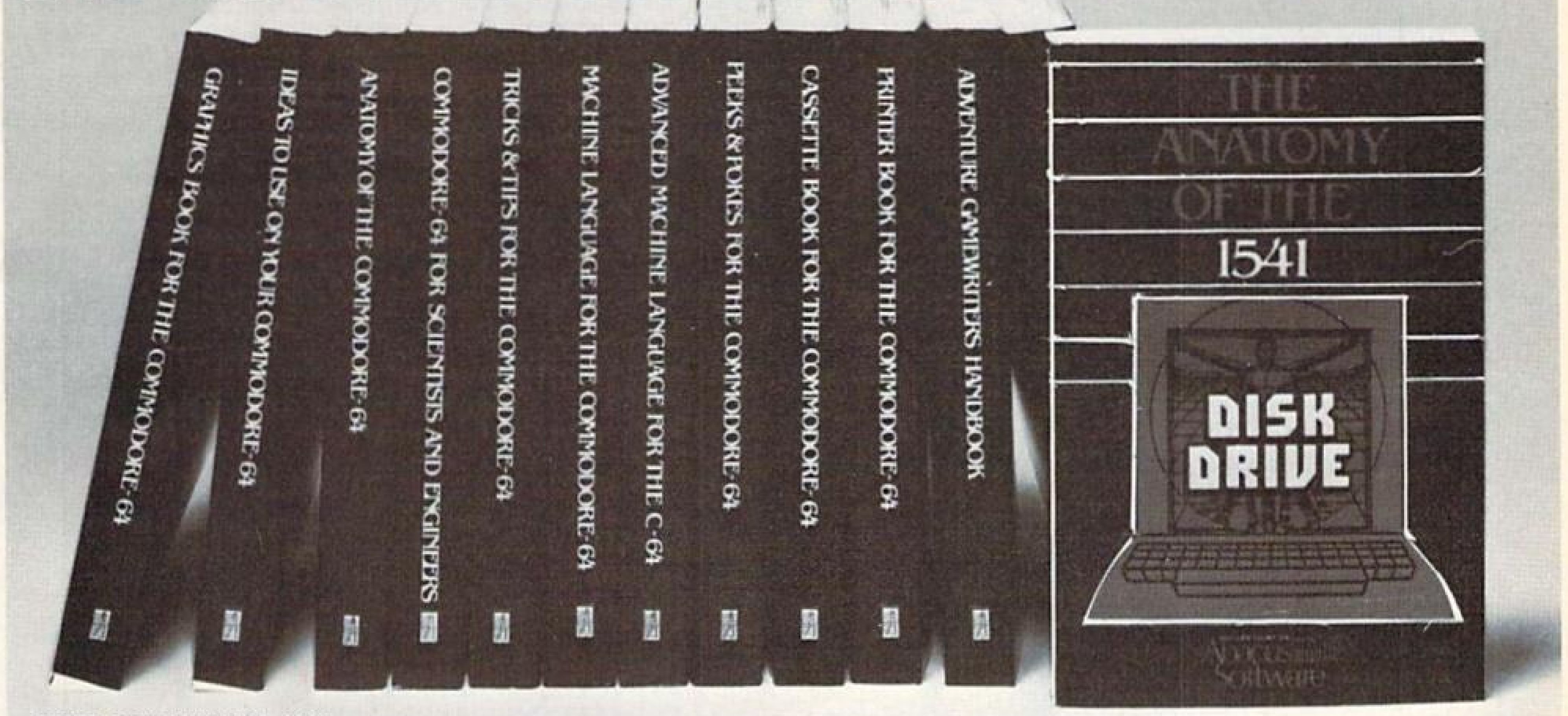
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Continued from pg. 42

```
20 DATA 225,227,228,229,231,232,234,
   235,236,237,238,239,240,241,242,
   243,0
25 FOR J=36874 TO 36878:POKE J,0
   :NEXT J
30 DIM Z%(34)
40 FOR J=0 TO 34:READ Z%(J):NEXT J
   :POKE 36879,90
50 POKE 36878,10
60 READ A$,B$
70 IF A$="Z"THEN 190
80 P=1
100 IF LEN(MID$(A$,P,1))=0 THEN 60
110 N=ASC(MID$(A$,P,1))-59
111 IF N=-2 THEN T=130:P=P+1:GOTO 110
112 IF N=-3 THEN T=80:P=P+1:GOTO 110
113 IF N=-4 THEN T=50:P=P+1:GOTO 110
115 X=INT(416*RND(1)):Y=INT(8*RND(1))
125 POKE 38510+X,Y:POKE 7790+X,81
130 G=Z%(N)
140 N=ASC(MID$(B$,P,1))-59
150 H=Z%(N):P=P+1
170 POKE 36876,G:POKE 36875,H
180 FOR X=1 TO T:NEXT:GOTO 100
190 FOR T=1 TO 1000:NEXT:RESTORE
    :GOTO 40
1000 DATA"7E]E]EEE]E]E]EEE]E]
     HHAAACEEEEEEE]F]F]F]FHF]E]E]EFE]
     C]C]E]CCCCHHHH"
1010 DATA"7AAHHJJHHAAHHJJHHAAHHJJIIHG
     HJKKHHJJMMIIFFAAHHJJHJGGMMJJGJ]
     MLJHFEC"
1020 DATA"E]E]EEE]E]E]EEE]E]
     HHAAACEEEEEEE]F]F]F]FHF]E]E]EFH]
     H]F]C]AAAAM]]]]]"
1030 DATA"AAHHJJHHAAHHJJHHAAHHJJIIHGH
     JKKHHJJMMIIFFAAHHJJHJHHLLJJLL]
     LJHA]]]]]"
1040 DATA"8CDEEHHGGHH]]]CCCH]HJHGE]E]
     E]J]JLJHG]G]G]L]LMLJHHEECDE]J]G]
     HHHHCCH]H]H]"
1050 DATA"8LLMLJJOMLH=]]
     MMMLLHHLLMMLLOONNJJNNOOLLQQPPLLP
     PQQMMLLMLJHJMLLHH]MLJHJMH"
1060 DATA"GGG]GGHHGGEECCC]JJLLJJHHOOC]
     CDEEJJGGHHH]CCH]HJHGE]E]E]J]
     JLJHG]G]G]"
1070 DATA"LLCCOOQQOOONMJHGCCHHJJLMLJH
     JLLMLJHJCHH==]MLLHHLLMMHH]
     ONNJJNNOOJJ]Q"
1073 DATA"L]LMLJHHEECDE]J]G]HH]]]]]]
     LLLLJJJJHHJJGGGGGG]]]"
1076 DATA"PPLLPPQQMMLLMLJLMJHH==]]]]
     LLLLMMMMKKKKLLL@@@]]]"
1080 DATA"8E]E]L]L]J]H]G]E]C]E]G]H]J]
     LLLLL]E]E]L]L]J]H]G]E]C]E]G]H]J]
     LLLLL]"
1090 DATA"8]]EEHHGGDDEE@@AAHHMMLLQOMQ
     QQPNPP]]EEHHGGDDEE@@AAHHMMLLQOMQ
     QQPNPL"
1100 DATA"LLMMJJLLMMOOQQLLJJHHEEGGHHJ
     JJ]HHJJLLLLMML]LLJJHHGGEEE]HGE]
     JJJJHHJJLLMM"
1110 DATA"IEJHGGHHJJLLMOQQNPQONJOJQJS
     QOMLLOOTQOHQQOOQHMGLEJDEEHHLJHHG
     GCCEEGGHHJJ"
1112 DATA"OOQQLLLJJJHHHGGGEEEEEEEEEE]
     ]GGGEGECCCC]]"
1114 DATA"LLMMQQQMMMKKKLLJJHHHHHEEEEE]
     ]CCCECEGGGG]]"
1120 DATA"9CCCCCLLLKL]L]
     MMMLMMNNOOTTSSQ]QQQNO]O]
     OOOMLLMMLLLJH]JJLLMMOOQQGGGJHH"
1130 DATA"9]]]]]HHONOORRSSJRSSWWXXXXW
     WNNOTXWX]T]SSOOTSQQPNPSQPOMOHSJT
     LTMOMLMLH"
1132 DATA"JJLLMMOOQQSSSSVVTTTT]]]]
     TTTTRROOMMMMMMM]OOOOQQTTRROOMMMM]
     ]]"
1134 DATA"GGHHJJLLMLJGCCGGHHHH]]]]
     HHHHJJLLMMQOMMM]KLH]HHKKJJKKMMMM]
     ]]"
1140 DATA"9MMMOMMJJJJJ]MMMOMMJJJJJ]
     TTT]TTQQQQQ]RRR]RRMMMMM]OOO]
     OORRRQOOMMMOMMJJJJJ]"
1150 DATA"9JJJKJJMMMOMMJJJKJJMMMOMMKM
     OMKMKKJJHHJKMJKMJJHHFFKKFFKKOOOM
     KKJJJKJJMMMOMM"
1160 DATA"OOO]OORRRQOOMMMOMMJJJJJ]TTT]
     TTWWWTQQRRRRR]VVVVV]
     RRRMJJMMMKHHFFFFFFFFFFF]]]"
1170 DATA"KKFFKKOOOMKKJJJKJJMMMOMMKKM
     MOOQQTTYWVVTTRRYYVVRRMMMMM]
     MMMMMKKKJJHHJJJJJ]]]"
1173 DATA"RRRQRRPPPOPPOOOMKKPPDDCCCCC
     CCC]]]"
1176 DATA"UWUTUYTUTSTYUWURUUPPTMKKIII
     FFF]]]"
1180 DATA"8KKKKHHHIKKPPPPOPRRPPOOMMKK
     KKK]OPRRPPOOMLKKPPHHKMKKIIHHFFKK
     K]KKK]"
1190 DATA"8PPOOMMKKPPOOMMKKIIMMJJSSTP
     OOMMKKIIMMJJSSTPOMKPQQRPOMKHFDCF
     IKIKMO"
1200 DATA"KKKKHHHIKKPPPPOPRRPPOOMMKKK
     KK]OPRRPPOOMLKKPPHHKMKKIIHHFFDDD
     DPP]]]]"
1210 DATA"PPOOMMKKPPOOMMKKIIMMJJSSTPO
     OMMKKIIMMJJSSTPOMKPQQRPOMKHFCDKM
     KDD]]]]"
1213 DATA"PPPPOOOO]RRRRRQQQQQQ]]"
1215 DATA"HHIIKKHH]OOKKKMKHHHH]]"
1220 DATA"8MMMMFFHJJHFFHJJHFFMOOLMMMM]
     MO]OMMJMMMKKJHHFHHJHHHH"
1230 DATA"8MMMMJJKMMKJJKMMKJHFKFKJHFJ
     KMKFKJKRQOMQQRMMJMQRQOMM"
1240 DATA"7JJKKMMMMRROOMMMMJJKKM]
     MMRROOMMMMJJKKMMMMOOJJKKHHFFEEFF
     FHJJFFKKKK"
1250 DATA"7RRQQMMJJKKKKJJFFMMKKJJMMOO
     KKJJFFMMOORRFFGJOSTROKJJKKJHFEFF
     JMOOMM"
1260 DATA"JJKKMMMMOOJJKKHHFFEEFFFFFFF
     FF]M]RR]]"
1270 DATA"RQOMJJFFGJOMOOKKMMMKJJHKJJH
     KJ]M]FF]]"
1300 DATA"Z","Z","Z"
```

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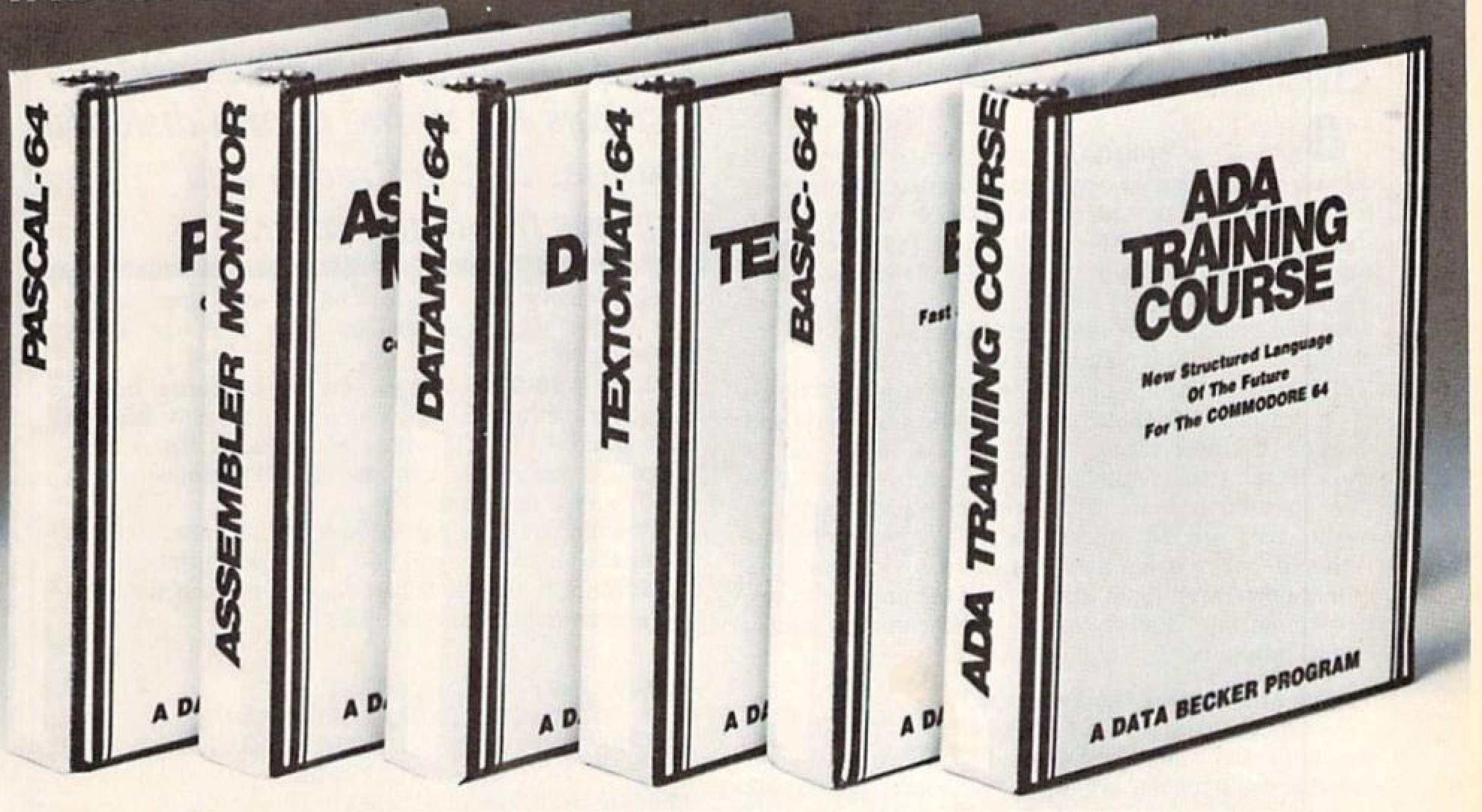

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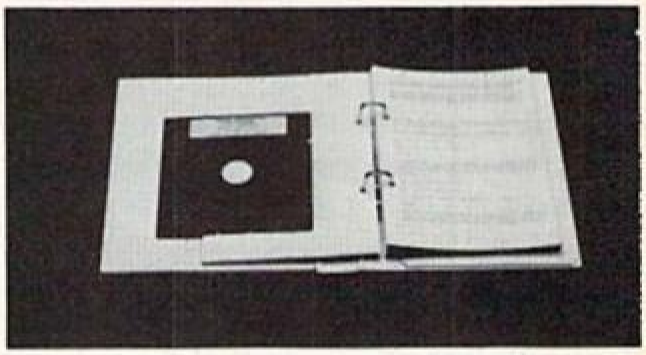

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Circle Reader Service No. 21

BY LOUIS F. SANDER

Renaming Diskettes on the 1541

This short program reads and displays the name of any diskette, changes it, then reads and displays the new name.

Often as a diskette accumulates programs and other files, the name it was originally assigned becomes inappropriate for one reason or another. Maybe a disk that started as GAMES would more appropriately be called CARD GAMES, or maybe UTILITYS, misspelled, would look nicer to your friends as UTILITIES. For whatever reasons, we really *could* use an easy way to change the names on our diskettes.

The short program below reads and displays the name of any diskette, changes it on request, then reads and displays the new name as proof that all went well. It *can't* change the two-character disk I.D. code, since that code is recorded 683 times on each diskette in places that are not accessible to normal programs. Although our program uses some highly technical (and highly powerful!) direct access disk commands, it can be entered and used by anyone who can type simple BASIC programs.

Typing and Testing the Program

As you type the program, be particularly careful with the lines that include OPEN, PRINT# and CLOSE commands, because errors in those lines can wreak havoc on unsuspecting diskettes. When you enter the PRINT# command, it's illegal to leave a space between the "PRINT" and the "#". Also, you *cannot* use the "?" abbreviation followed by a "#". If you make this error, the resulting line will look perfectly normal, but will give you a syntax error every time it's executed. The proper abbreviation for PRINT#, as listed in your user's guide, is "P shift R".

In line 180, the material between the quotes *must* be 16 *shifted* spaces. And the PRINT# statement in line 200 *must* end with a semicolon.

After you type the program, save it on a good diskette. Then test it on an unimportant scratch disk, just in case you've included some sort of destructive error. Add a program or two to a newly formatted diskette (the scratch disk), then change its name a few times. (If you press return in response to the "New Name" prompt, the former name will be retained.)

If everything seems to be working, run one of the programs on the disk, just to be sure some subtle programming error hasn't overwritten them. At that point, your disk renamer has passed the acid test and you should be able to use it safely for a long, long time.

Theory of Operation

The program is simple and straightforward, but the direct access commands may be unfamiliar, so we'll outline their operation here.

Lines 120-130 prepare the 1541 for direct access operation—for having its sectors read and written directly, rather than as parts of programs or files.

Line 250 finds the disk sector which holds the disk name, and stores a copy of that sector in the 1541's buffer memory. Line 260 locates the disk name within that buffer and lines 280-300 store it in the string variable DN$.

Lines 190-200 operate on the memory buffer, replacing the original disk name with the new one you have entered. Line 210 writes the revised buffer onto the original sector of the disk and line 230 terminates the direct access activities.

Assuming that you can follow the other lines, that's all there is to renaming a diskette. We hope this little utility is as useful to you as it has been to us, and we hope you'll remember where you got it! **C**

```
100 PRINT"[CLEAR,DOWN]
     DISKETTE RENAME PROGRAM"'BAPC
110 PRINT"[DOWN] LOUIS F. SANDER,
     4/24/84[DOWN]"'BAGC
120 OPEN 15,8,15'BHAX
130 OPEN 2,8,2,"#"'BGBY
140 GOSUB 250'BDKA
150 PRINT TAB(15)"[DOWN2,CMDR T16,UP2]
    ":NN$=DN$'DKDP
160 INPUT"[SPACE5]NEW NAME";NN$'BEGF
170 IF LEN(NN$)>16 THEN PRINT
    TAB(14)"[DOWN,RVS]TOO LONG!"
    :GOTO 150'HOFL
180 NN$=NN$+"[SHFT SPACE16]"'CGKP
187 :'ABHK
188 REM ** WRITE NEW DISK NAME **'BUWQ
189 :'ABHM
190 PRINT#15,"B-P:";2;144'BJDH
200 PRINT#2,LEFT$(NN$,16);
    :REM NO CR!'DRJB
210 PRINT#15,"U2:";2;0;18;0'BMMA
212 :'ABHY
220 GOSUB 250'BDKY
225 PRINT#15,"IO"'BDUE
230 CLOSE 2:CLOSE 15'CESB
240 END'BACA
247 :'ABHH
248 REM ** READ DISK NAME **'BQIM
249 :'ABHJ
250 PRINT#15,"U1:";2;0;18;0'BMLE
260 PRINT#15,"B-P:";2;144'BJDF
270 DN$=""'BDDE
280 FOR I=1 TO 16'DEIG
290 GET#2,A$:DN$=DN$+A$'DOMJ
300 NEXT'BAEW
310 PRINT"[DOWN] DISK NAME IS
    : "DN$'BDND
320 RETURN'BAQY
```

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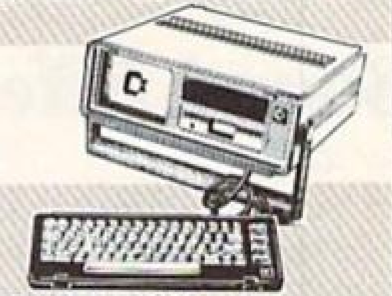

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Circle Reader Service No. 24

BY GIL HURLBUT

Sound Effects Library

For the VIC 20

Do you want to keep a library of sound effects? Sounds can greatly enhance any program, whether it's a game or word processing. The BASIC statements that create the sounds can be organized to find them easily and hear the results. It can also be possible to test a variety of changes to discover what happens.

Sound Library provides an example of how sound-creating BASIC statements can be displayed while the sound is made. Several sound effects for such standards as laser blasts and dropping bombs are included as well as some different ones.

The general approach is to use a menu to select the desired sound. The line numbers for each group of statements are used in a subroutine to list them. A technique known as dynamic keyboard handles the listing by poking codes into the keyboard buffer.

To make changes, press RUN/STOP after the sound finishes. Then move the cursor up to change the statements. When you rerun the program, the changes will be in effect. For example, try modifying the bomb by changing the sound start from 230 to 220. **C**

VIC 20 Sound Library

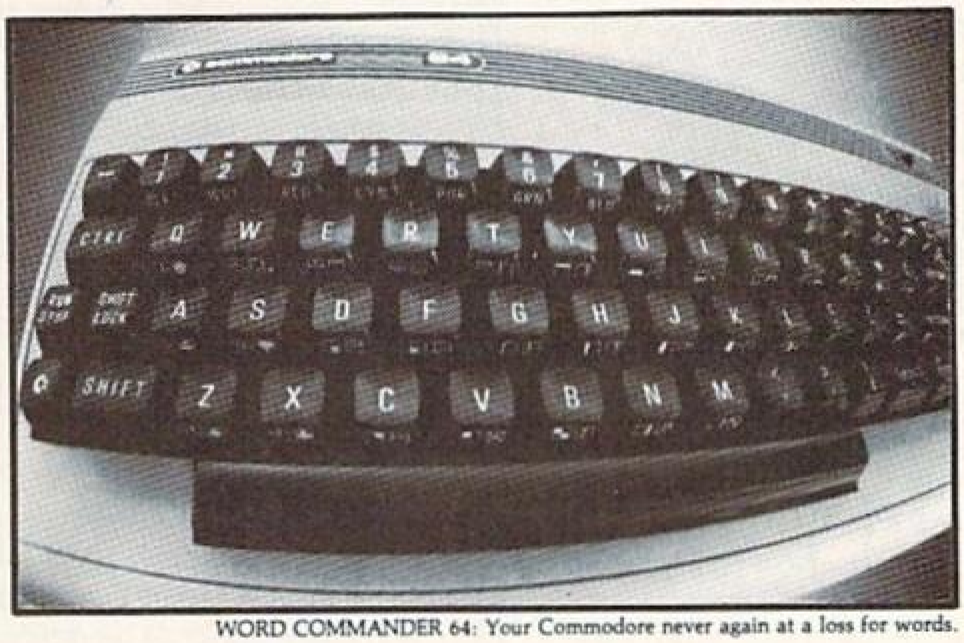
```
10 REM  SOUND EFFECTS LIBRARY
20 PRINT CHR$(147)" SOUND LIBRARY",,,
   "[SPACE2]1 RACING CAR"
30 PRINT"[SPACE2]2 LASER BLAST "
   :PRINT"[SPACE2]3 TORP BLASTS
   [SPACE4]":PRINT"[SPACE2]
   4 UFO LANDING[SPACE3]"
40 PRINT"[SPACE2]5 OLD PLANE FLYAWAY",
   "[SPACE2]6 BOMB[SPACE3]","[SPACE2]
   7 SIREN",,,,"[SPACE4]PICK ONE"
50 GET A$:IF A$=""THEN 50
60 ON VAL(A$)GOTO 100,200,300,400,500,
   600,700
70 POKE 214,15:PRINT" PRESS ANY KEY"
80 GET A$:IF A$=""GOTO 80
90 GOTO 20
100 L1=110:L2=130:GOSUB 2000
110 POKE 36878,15
120 FOR N=135 TO 200 STEP.5
    :POKE 36875,N:POKE 36876,N
130 POKE 36875,0:POKE 36876,0:NEXT
140 GOTO 70
200 L1=210:L2=240:GOSUB 2000
210 POKE 36878,15
220 FOR N=1 TO 6:S=241:POKE 36876,S
    :POKE 36876,0:S=S-1:POKE 36876,S
230 S1=135:POKE 36875,S1:POKE 36875,0
    :S1=S1+1:POKE 36875,S1
240 POKE 36875,0:POKE 36876,0:NEXT N
250 GOTO 70
300 L1=310:L2=320:GOSUB 2000
310 POKE 36878,15
320 FOR N=1 TO 3:FOR S=241 TO 135
    STEP-3:POKE 36875,S:POKE 36875,0
    :NEXT S:NEXT N
330 GOTO 70
400 L1=410:L2=430:GOSUB 2000 ANY KEY
410 POKE 36878,15
420 FOR N=1 TO 5:FOR S=200 TO 220+N*2
    :POKE 36876,S:NEXT S:NEXT N
430 POKE 36876,0:POKE 36878,0
440 GOTO 70
500 L1=510:L2=520:GOSUB 2000
510 FOR V=13 TO 0 STEP-.02
    :POKE 36878,V
520 POKE 36877,212:POKE 36877,0:NEXT
530 GOTO 70
600 L1=610:L2=630:GOSUB 2000
610 POKE 36878,15
620 FOR S=230 TO 128 STEP-1
    :POKE 36876,S:FOR N=1 TO 20:NEXT N
    :NEXT S
630 POKE 36876,0:POKE 36877,200
    :FOR N=15 TO 0 STEP-.2
    :POKE 36878,N:NEXT N:POKE 36877,0
640 GOTO 70
700 L1=710:L2=730:GOSUB 2000
710 POKE 36878,15
720 FOR N=1 TO 5:POKE 36875,200
    :FOR J=1 TO 500:NEXT J
730 POKE 36875,0:POKE 36876,200
    :FOR J=1 TO 500:NEXT J
    :POKE 36876,0:NEXT N:POKE 36878,0
740 GOTO 70
2000 PRINT CHR$(147)CHR$(5)"RETURN"
     :PRINT"LIST";L1;"-";L2;
2010 POKE 631,19:POKE 632,17
     :POKE 633,31:POKE 634,13
2015 POKE 635,19:POKE 636,13
     :POKE 198,6:END
```

```
380 REM EYES
390 C=0:ON K GOSUB 410,440,470
400 K=FN R(3):C=2:ON K GOSUB 410,440,
    470:RETURN
410 REM EYES RIGHT
420 CIRCLE C,362,565,20,20
430 CIRCLE C,715,560,20,20:RETURN
440 REM EYES LEFT
450 CIRCLE C,310,560,20,20
460 CIRCLE C,668,560,20,20:RETURN
470 REM EYES CENTER
480 CIRCLE C,335,560,20,20
490 CIRCLE C,690,560,20,20:RETURN
500 REM MOVING HEAD
510 P=PEEK(36864):PV=PEEK(36865):P1=P
    :P2=PV:S=1
520 FOR Z=1 TO FN R(12)+9
530 H=FN R(3)-2:IF P1+H<0 THEN 530
540 POKE 36864,P1+H:IF
    ABS(P1+H)<ABS(P+5)THEN P1=P1+H
```

Continued on pg. 50

For The C64

"Introducing the Word Processor with Less."



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Circle Reader Service No. 25

Continued from pg. 48

```
550 V=FN R(3)-2
560 POKE 36865,P2+V:IF
    ABS(P2+V)<ABS(PV+5)THEN P2=P2+V
570 GOSUB 580:NEXT Z:POKE 36864,P
    :POKE 36865,PV:RETURN
580 S=VAL(RIGHT$(TI$,1)):S1=1
    :IF S/2=INT(S/2)THEN S=2
590 ON S GOTO 600,610
600 SOUND 220,221,0,0,15:GOTO 620
610 SOUND 222,223,0,0,15
620 GOSUB 360:RETURN
630 REM RANDOM SOUNDS
640 FOR X=1 TO FN R(40)+15
650 FOR Y=1 TO 3:S(Y)=FN R(255):NEXT Y
660 SOUND S(1),S(2),S(3),0,15
670 FOR DEL=1 TO FN R(350)+50:NEXT DEL
    :NEXT X:RETURN
680 REM MOUNTAIN KING
690 FOR X=1 TO KT:SOUND N(X),0,0,0,15
    :GOSUB 360:NEXT X
700 SOUND 0,0,0,0,0:RETURN
710 DATA 170,179,183,191,198,183,198,
    198
720 DATA 195,179,195,195,191,174,191,
    191
730 DATA 170,179,183,191,198,183,198
740 DATA 213,207,198,183,198,207,207,
    207,207,-1
750 REM COLORS
760 Q=PEEK(36879)
770 FOR X=1 TO 9:R=FN R(255)
    :POKE 36879,R:GOSUB 350:NEXT
780 POKE 36879,Q:RETURN
790 REM LAB SOUNDS
800 S1=FN R(25)+210:Z=FN R(7)
    :FOR Y=1 TO Z
810 FOR X=S1 TO S1-60 STEP-1
    :SOUND X,X+10,0,0,15:NEXT X
820 FOR X=S1-60 TO S1:SOUND X,X+10,0,
    0,15:NEXT X
830 NEXT Y:RETURN
840 REM SPOOKY ORGAN
850 SOUND 207,227,236,0,13:GOSUB 370
860 SOUND 207,227,235,0,13:GOSUB 370
870 SOUND 204,225,237,0,13:GOSUB 370
880 FOR X=13 TO 0 STEP-1:GOSUB 360
    :SOUND 204,225,236,0,X:NEXT X
890 SOUND 217,232,239,0,15
900 FOR X=1 TO FN R(5)+4
    :SOUND 217,232,239,0,14
910 GOSUB 360:SOUND 217,232,239,0,15
920 GOSUB 360:NEXT X:RETURN
930 REM CALL THE EFFECTS
940 FOR A=1 TO 8
950 ON A GOSUB 380 ,680,300,500,750,
    300,630,790,840
960 NEXT A:GOTO 970
970 REM RANDOM SELECTION OF EFFECTS
980 R=FN R(8)
990 ON R GOSUB 300 ,380,500,630,680,
    750,790,840
1000 GOTO 970
```

BY ROLF L. MILLER

Sound Off

For the Commodore 64

Ever powered up, loaded, and run a program which takes a more than average time to process its input? Ever wonder if the computer was actually working or just sitting there doing nothing?

A common way to know is to have a flashing signal displayed during the processing routine. This method, however, tends to slow things down—slightly to be sure, but enough to discourage its use in long running tasks. Furthermore, it does require looking at the display. Of course, this is better than not knowing, but there can be a better way.

Sound can be implemented instead and it takes less time as compared to display. First, it can be turned on and set up at program top. Then a couple of POKEs during the processing routine will tell that everything is working without having to look. Furthermore, a signal can be sounded to indicate "done".

The following brief model routine sounds a bell during a simulated processing loop in line 30. Then "done" is signaled by a fast repeating tone.

Line 10 assigns to S the beginning address of the sound chip and clears all 25 registers.

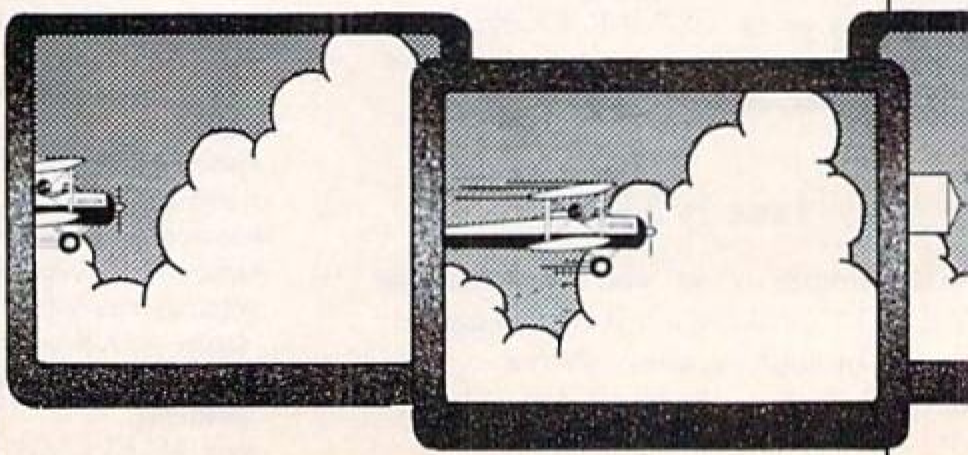
Line 20 sets the note and attack/decay rate for voice one and sets the volume at loudest.

Line 30 will loop ten times, POKEs the voice-one waveform to create the sound, holds it during the Y loop and turns it off before NEXT.

Line 40 sounds the repeating tone until any key is pressed.

Line 50 turns off the volume. **C**

```
10 S=54272:FOR L=0 TO 24:POKE S+L,0
   :NEXT'HRUF
20 POKE S+1,68:POKE S+5,9
   :POKE S+24,15'GRPF
30 FOR X=1 TO 10:POKE S+4,17
   :FOR Y=1 TO 500:NEXT:POKE S+4,20
   :NEXT:PRINT"DONE"'NAON
40 POKE S+4,21:GET Q$:POKE S+4,20
   :IF Q$=""THEN 40'ITUJ
50 POKE S+24,0'CFKD
```



BY MARK JORDAN

Enhance Your BASIC Game with an Interrupt

Good games can be written in BASIC. The Commodore 64, with its programmable sprites, is especially suited for BASIC game writing. But, as we all know, it's a challenge. Speed becomes paramount to everything else. The result is, all too often, a stripped-down, barebones contest with few graphic extras.

The program listed here helps solve that problem. It is an interrupt-driven routine that, once installed, goes about its business completely independent of your program. It won't slow you down one iota. And the nicest thing about it, you don't have to understand it. Just type it in, attach it to your BASIC masterpiece and it's off and running.

This routine will move a sprite (number seven) across the screen over and over again. It will not be flustered by the invisible seam in the Commodore screen but will glide smoothly across it. You may use any sprite shape you wish: a star, a hot air balloon, a tumbleweed or a jet. In the companion routine listed, a cloud is chosen to slide silently by.

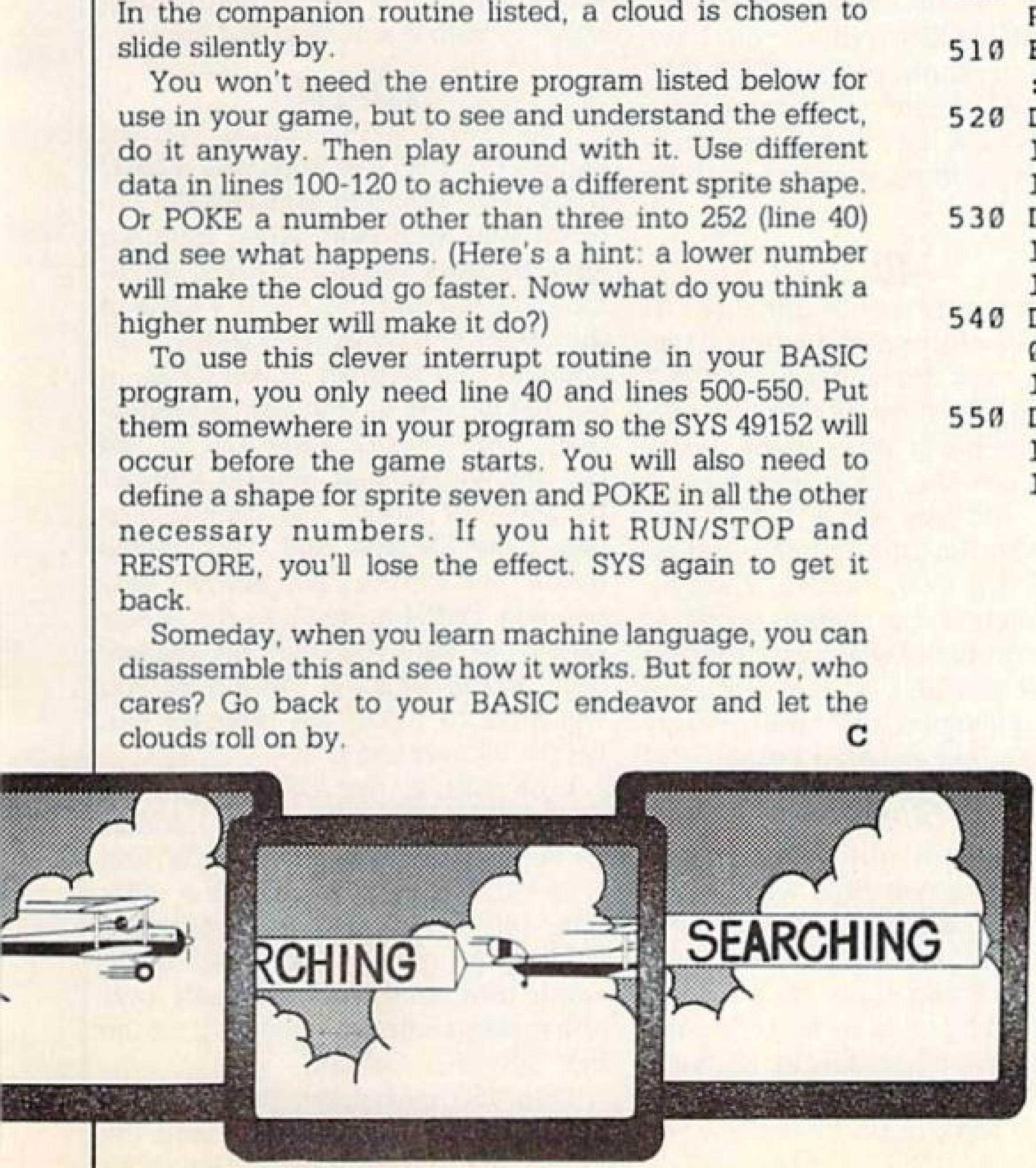
You won't need the entire program listed below for use in your game, but to see and understand the effect, do it anyway. Then play around with it. Use different data in lines 100-120 to achieve a different sprite shape. Or POKE a number other than three into 252 (line 40) and see what happens. (Here's a hint: a lower number will make the cloud go faster. Now what do you think a higher number will make it do?)

To use this clever interrupt routine in your BASIC program, you only need line 40 and lines 500-550. Put them somewhere in your program so the SYS 49152 will occur before the game starts. You will also need to define a shape for sprite seven and POKE in all the other necessary numbers. If you hit RUN/STOP and RESTORE, you'll lose the effect. SYS again to get it back.

Someday, when you learn machine language, you can disassemble this and see how it works. But for now, who cares? Go back to your BASIC endeavor and let the clouds roll on by. **C**

An Interrupt-Driven Cloud

```
5 REM  THIS IS CLOUD ROUTINE
10 FOR T=12736 TO 12798:READ A
   :POKE T,A:NEXT
20 V=53248:POKE 2047,199
   :POKE V+21,128:POKE V+46,12
   :POKE V+14,0:POKE V+15,55
30 POKE V+29,128
40 POKE 251,5:POKE 252,3
100 DATA 0,0,0,0,48,0,1,248,0,3,
    248,0,7,254,0,31,255,0,63,
    254,0,63,255,0
110 DATA 31,255,192,127,255,192,
    255,255,192,255,255,128,127,
    255,128,31,254,0
120 DATA 15,254,0,15,252,0,1,240,
    0,0,240,0,0,96,0,0,0,0,0,0,0
500 REM  THIS IS INTERRUPT
    ROUTINE
510 FOR T=49152 TO 49229:READ A
    :POKE T,A:NEXT:SYS 49152
520 DATA 120,169,13,141,20,3,169,
    192,141,21,3,88,96,198,251,
    165,251,240,3,76
530 DATA 74,192,173,16,208,41,
    128,240,23,173,14,208,201,
    101,208,31,173,16,208
540 DATA 37,127,141,16, 208,169,
    0,141,14,208,76,67,192,173,
    14,208,201,255,208
550 DATA 8,173,16,208,5,128,141,
    16,208,238,14,208,165,252,
    133,251,76,49,234,0
```



KIDS' CORNER

BY DR. PETRIE CURRYFAVOR

CYPHERIGHTER and DECYPHERIGHTER for Commodore 64 and VIC 20

Hi There, Kids! Dr. Curryfavor Writes again!! And what do we have *This* Time? Not One, but *two* wonderful programs that produce a classic type of Substitution Code Book! The most familiar example of this type of code can usually be found in your Daily Newspaper on the Crossword Puzzle Page and they are usually called "Cryptograms" or some such. (If your paper does *not* have one, maybe after you type in these programs, you can offer to sell them some!)

In a typical cryptogram, every letter in the alphabet is represented by another letter. This method of cyphering has been around for hundreds of years and many variations have been used to make them more difficult to solve. CYPHERIGHTER will allow you to write MESSages in one of the simpler forms of this sort of encryption and will permit you to PRINT your MESSage on your printER and also to SAVE and LOAD your MESSage on either tape or disk. Since CYPHERIGHTER is our main program let's lOOk at it first!

CYPHERIGHTER

1-10

This program will RUN on either the Commodore 64 or the VIC 20—but NOTICE that in order for it to work on the VIC, you must *NOT* type in Lines 1 through 10. This is a fairly large program and uses almost ALL of the VIC 20 memory, so the REM statements (which the Komputer ignores, anyWay) Must be REMoved! Line 10 is for the 64 *only* and it just turns the screen White.

20

This Line builds clever old Dr. Curryfavor's famous Format $trings. D$ begins with HOME and has 22 CuRSoRs Down. R$ is a $tring of 22 CuRSoRs right and F$ is 22 SPaces in ReVerSe Blue. K$(460) is an arRAy to hold both our Original MESSage and the CoDed MESSage (20 lines of 23 CHaRacters.)

Create your own cryptograms with yet another code program from the inimitable doctor.

30

Here we CLeaR the screen and the Komputer asks you for a code number from zero to 255. Any number less than (<) zero OR Greater than (>) 255 will not be accepted! BeCause we changed the cursor color to White, you will have to type the Number very carefully, BeCause it will Be InVisible! This way, no One can see your Secret CODE NUMBER! When you have typed your Number, hit RETURN. Nothing will seem to happen for a while, because now your Komputer is Very busy building your Secret CoDe $string.

40

But First, we have to Initialize CN and NC for our printer routine. Then we do a very tricky piece of PROgramming to make sure that our RaNDom CoDe $tring is the same. Every time we use the same Secret Code Number. Did you know that if you "Seed" the RaNDom number generator with a *minus* number, it will always generate the Same series of RaNDom numbers when you RUN the program? FNR(N) is the RaNDom Number FuNction that will actually form our CoDed alphabet $tring.

50-90

Here's where our Komputer is spending all of that time while we're waiting for someThing to HaPPen! Line 50 starts our LooP to build a 26-CHaRacter $tring. Line 60 selects a RaNDom Number from 65 to 90 (the ASCII code numbers for the letters A to Z). Line 70 begins our "checker" LooP—we don't want to use any letter more than ONcE, so in Line 80, IF we find that CD$ already has C$ in it, we GO back TO 60 to get a new C$. If we get to Line 90 without finding a duplicate, we add C$ to our CoDe $tring; this is called "conCatenating" (which means "linking ToGetHer"). When we have completed CD$, which is now a scrambled alphabet, we set our Row counter to Row 1 and GO TO the MAIN MENU at Line 270.

100

Here is where we do our forMatting; we CLeaR the screen and paint the ToP half in Blue. On the 64, we just use the UPPer Left corner. The VIC has a 22-column screen, while the 64 has 40 columns. Since you will be sending MESSages to other Silicon Panther Youth Squad members (S.P.Y.S.), you want the MESSages to Be "transportable" to both machines.

110-190

This is the Main Loop! IF you selected (1) ENTER from the MAIN MENU, the program sent you Here to eNter your MESSage. When you hit a key, the letter you hit becomes A$. In Line 120 we find the ASCII VALue of that letter and make the variable "A" equal to that number. If you lOOk up the ASCII code in your User's Manual (Page 145 for VIC, Page 135 for the 64), you will see that 95 is the number for the Left Arrow key (someTimes called the ESCape key). This means that IF you hit the "Left Arrow" key, you will THEN go back to the MAIN MENU. Be sure you Don't hit this key until you're finished writing or you will have to STOP the program and RUN it all over again.

Line 130 is our DELete routine (CHR$(2)=DELete). K is the Kounter for building our arRAy in Line 200 and C is the Column counter (line 220). Line 140 keeps our DELete function working by moving the cursor backwards through the Columns and rows and making sure we don't go past the first Row, first Column.

Line 150 makes the RETURN key work just like a typeWriter. Line 160 limits us to ten Rows—plan your MESSages carefully so that they will fit! Line 170 makes sure that we only change the letters! (Punctuation marks, numbers, etc., will stay the same in our CoDed MESSage.)

Here's where we get tricky! In Line 180, when we subtract 64 from the ASCII values of the letters of the alphabet, we get a range of numBers from one to 26—B$ will then Be the letter in the MIDdle (or ends) of CD$ that CorresPonds to the *same* position that A$ would have in the *Real* Alphabet!

Line 190 uses our ForMatting $trings to first PRINT A$ in ReVerSe Blue in the *Top* part of the screen and then PRINT B$ in ReVerSe OFF in the *bottom* part of the screen. R and C select the Row and Column in which each will be PRINTed by selecting the ProPer number of CuRSoRs Down and CuRSoRs Right.

200

IF we *didn't* hit DELete, we THEN build our arRAy—first A$ (the Real letter) and then B$ (our CoDe letter). K is our Kounter number.

210

IF we hit DELete or RETURN, we don't want to add another Column, so back to GET a new letter.

220

Here's where we add to our Column counter. IF C is Greater than 21, we have run out of space on the VIC 20 screen so we turn A$ into a RETURN (CHR$(13)) and GO back TO 120 so we can run back through our PRINT routine. This means that if the line you aRe typing goes all the way to the end, you will AUTOmatically move to the next Row (see Line 150), so Don't press RETURN or you will skip a line. Keep your eyes on the screen!

230

Back for More!

240-260

IF we type More than ten lines (Line 160), we get this message and Line 250 is our MENU prompt. IF we hit the left Arrow key (Line 260), we fall through to the...

270-310

MAIN MENU! In Line 290, the White color control after the "PRINT" means that our eNtry will again Be InVisible! You will select a nuMber from one to five (or your Secret PassWord—Line 300) and Press RETURN. M is the VALue of the nuMber $tring. Line 300 is another Sneaky Trick from crafty old Dr. Curryfavor! This is your Secret Password! Sly old Dr. C. chose the "spade" symbol (SHiFT A), but yoU could use any Graphics CHaRacter (or Combination of CHaRacters) using the SHiFT or CoMmoDoRe keys. You can even use letters or words, if you wish. You could Hide this line with a DELete line, as in OBFUSCODE (in the August/September issue of *Power/Play*). M=1, so that we can get cute when we GO to Line 320, the DISPLAY/decode SUBroutine. Line 310 sends us to our utility SUBroutines and then we GO TO the MENU prompt.

320

This One line is Both a DISPLAY (to show the CoDed MESSage) and our DeCoder (to show us what we really wrote!). Since our arRAy has Both sets of letters in alternation, if we STEP through in two-STEP increments, we will see only one set at a time. (If you would like to see the whole arRAy, you could STOP the program and type:

```
FORK=0TO460:
PRINTK$(K);:NEXT
```

and you will notice that if you read every other letter, you will see your Original message! To get back to the proGram, type: GOTO 270 to return to the MENU. IF we selected (2) DISPLAY, when M=M-1 (=1), we start DISPLAYing just the CoDed MESSage. IF we selected our PassWord, we start with zero (that's why M=1 in Line 300).

330-350

Both SAVE and LOAD come here first. First we give our message a FILE NAME. If you're using a Disk drive, Be sure you do NOT choose a Name that is already SAVEd on the Disk. You will also be asked to select Tape or Disk. IF you select "D," Line 340 will set your variables to the Proper values to Write a Sequential Disk file. IF you selected (4) LOAD, Line 350 will make sure you GO TO the Proper SUBroutine.

360-370

Here's where we SAVE the arRAy. When the Job is Done, we will RETURN to the MENU prompt.

380-410

After setting uP the TaPe or Disk drive (Line 380), we GET the ChaRacters one at a time and LOAD them into our arRAy. IF our STatus (Line 400) does NOT equal zero, we're finished, so we CLOSE up shop and RETURN (Line 410).

420-450

Now here's where your Brilliant friend, Dr. Curryfavor, really gets slick! This is the printER SUBroutine and we are going to Begin by PRINTing our Secret Code Number! However, to *keep* it secret, we aRe going to PRINT it as a Binary number to conFuse anyBody who might find our Secret MESSage! CN$ is the Binary number $tring. After PRINTing CN$, we PRINT the MESSage and RETURN to the MENU so you can PRINT as many copies as you want. The finished MESSage is small enough to be Hidden in a Stick of Gum or an old Ball Point Pen, or whatever, so you can pass it on to anOther S.P.Y.

DECYPHERIGHTER

Once we have PRINTed out our Secret MESSage on our PrintER, we need a way to DEcypher it easily and This Is It! When someBody passes you a Secret MESSage, you can figure out the Secret Code Number by translating the Binary number at the top of the Note. When you RUN the ProGram, eNter the Decimal equivalent of that number and wait for the Komputer to build the CoDe $tring. Start typing in the MESSage when the screen CLeaRs and you will see it being DeCyphered as you type!

10

Due to a peculiarity in the 64, when you ask it for the amount of FREe memory, you will get a *minus* number (unless you have a really big program in it)! This is useful anyWay, beCause we can write One program that will RUN on Both machines, since the FRE(0) function on the VIC 20 will return a *positive* number. What this line does is to turn the 64 screen White.

Continued on pg. 55

```
1 REM ***** CYPHERIGHTER *****'BWRE
2 REM ***** COMMODORE 64 *****'BVPF
3 REM *FOR VIC 20, DELETE LINES 1
  THROUGH 10 OR PROGRAM WILL *NOT*
  RUN!!'BESQ
4 REM BY DR. PETRIE CURRYFAVOR,
  1984'BBDJ
5 REM 2928 TENNESSEE NE,
  ALBUQUERQUE NM 87110 (505)
  299-1662'BWNP
9 REM *************************'BYBL
10 POKE 53281,1:REM C-64 ONLY!!'CSEC
20 D$="[HOME]":F$="[RVS,BLUE]"
   :FOR S=1 TO 22:D$=D$+"[DOWN]"
   :R$=R$+"[RIGHT]":F$=F$+" ":NEXT
   :DIM K$(460)'NJJO
30 INPUT"[CLEAR]CODE NUMBER[WHITE]";N
   :IF N<0 OR N>255 THEN 30'GLAJ
40 CN=N:NC=N:N=RND(-N):DEF FN
   R(N)=INT(RND(1)*26)+65'MBFO
50 FOR R=1 TO 26'DESD
60 C$=CHR$(FN R(N))'DIXF
70 FOR N=1 TO R'DDRF
80 IF C$=MID$(CD$,N,1)THEN C$=""
   :GOTO 60'GQQL
90 NEXT:CD$=CD$+C$:NEXT:R=1
   :GOTO 270'GRQM
100 PRINT"[CLEAR]":FOR F=1 TO 10
    :PRINT LEFT$(D$,F)F$:NEXT'HPCD
110 GET A$:IF A$=""THEN 110'EIBA
120 A=ASC(A$):IF A=95 THEN 270'FMMC
130 IF A=20 THEN A$=" ":K=K-2
    :C=C-1'INGG
140 IF C<0 THEN C=21:R=R-1
    :IF R<1 THEN R=1:C=0'LRGK
150 IF A=13 THEN R=R+1:C=0'GJZG
160 IF R>10 THEN 240'DGSE
170 IF A<65 OR A>90 THEN B$=A$
    :GOTO 190'HORJ
180 B=A-64:B$=MID$(CD$,B,1)'EQTJ
190 PRINT LEFT$(D$,R)LEFT$(R$,C)"[RVS]
    "A$"[RVOFF]"LEFT$(D$,
    11+R)LEFT$(R$,C)B$'GFPP
200 IF A<>20 THEN K$(K)=A$:K=K+1
    :K$(K)=B$:K=K+1'KBNI
210 IF A=20 OR A=13 THEN 110'FJGC
220 C=C+1:IF C>21 THEN A$=CHR$(13)
    :GOTO 120'IRPG
230 GOTO 110'BDBA
240 PRINT LEFT$(D$,11)"[RVS,RED]
     *** FILE[SPACE2]FILLED *** [BLUE]
    "'CHTH
250 PRINT LEFT$(D$,22)"[RVS,PURPLE]
     * PRESS [BACK ARROW] FOR MENU *
    [BLUE]";'CIDJ


260 GET M$.IF M$<>"[BACK ARROW]
    "THEN 260'FIYH
270 PRINT"[CLEAR,RVS,BLUE]
     *** CYPHERIGHTER *** "
    :PRINT"[HOME,DOWN,RVS] ***[SPACE2]
    MAIN[SPACE2]MENU[SPACE2]*** "'CBFO
280 PRINT"[DOWN] (1) ENTER"
    :PRINT"[DOWN] (2) DISPLAY"
    :PRINT"[DOWN] (3) SAVE"'DCAN
290 PRINT"[DOWN] (4) LOAD"
    :PRINT"[DOWN] (5) PRINT[WHITE]"
    :INPUT M$:M=VAL(M$)'FKBO
300 IF M$="[SHFT A]"THEN M=1
    :GOSUB 320'FIMC
310 ON M GOSUB 100,320,330,330,420
    :GOTO 250'DYRE
320 M=M-1:PRINT"[CLEAR,BLUE]"
    :FOR K=M TO 460 STEP 2
    :PRINT K$(K);:NEXT:RETURN'KUEK
330 INPUT"[CLEAR,BLUE]FILE NAME";N$
    :INPUT"[RVS]T[RVOFF]APE OR [RVS]D
    [RVOFF]ISK";SD$'CIPK
340 SD=1:IF SD$="D"THEN AC=2:SD=8
    :IF M=3 THEN N$="0:"+N$+",S,
    W"'MVFP
350 IF M=4 THEN 380'DFAF
360 PRINT"[CLEAR]SAVE "N$
    :OPEN 1,SD,2,N$'CMLI
370 FOR K=0 TO 460:PRINT#1,K$(K);:NEXT
    :CLOSE 1:RETURN'HSOL
380 PRINT"[CLEAR]LOAD "N$
    :OPEN 1,SD,AC,N$'CNDK
390 GET#1,G$:K$(K)=G$:K=K+1'ERYM
400 IF ST=0 THEN 390'DGLB
410 CLOSE 1:RETURN'CCCA
420 B=128:FOR BY=0 TO 7
    :IF CN>=B THEN CN$=CN$+"1":CN=CN-B
    :GOTO 440'NEUP
430 CN$=CN$+"0"'CGVD
440 B=B/2:NEXT:PRINT"[CLEAR,BLUE]
    PRINT "CN$:OPEN 1,4:CMD 1
    :PRINT#1,CN$:CN$="":CN=NC'JETQ
450 FOR K=1 TO 460 STEP 2
    :PRINT#1,K$(K);:NEXT:PRINT#1
    :CLOSE 1:RETURN'JVGM
```

```
1 REM ***** DECYPHERIGHTER *****'BYXF
2 REM * COMMODORE 64  OR VIC 20 *'BUOF
3 REM BY DR. PETRIE CURRYFAVOR,
  1984'BBDI
4 REM 2928 TENNESSEE NE, ALBUQUERQUE,
  NM 87110 (505) 299-1662'BXHO
10 IF FRE(0)<0 THEN POKE 53281,1'FLSC
100 FOR A=65 TO 90:AL$=AL$+CHR$(A)
    :NEXT'HQXC
110 INPUT"[CLEAR,BLUE]CODE NUMBER
    [WHITE]";K:IF K<0 OR K>255 THEN
    110'GMSG
120 K=RND(-K):DEF FN R(N)=INT(RND(1)
    *26)+65'KSFH
130 FOR R=1 TO 26'DESA
140 C$=CHR$(FN R(N))'DIXC
150 FOR N=1 TO R'DDRC
160 IF C$=MID$(CD$,N,1)THEN C$=""
    :GOTO 140'GRNI
170 NEXT:CD$=CD$+C$:NEXT'EKTG
180 PRINT"[CLEAR,RVS,BLUE]
     ** DECYPHERIGHTER ** "'BAYJ
190 GET A$:IF A$=""THEN 190'EIJI
200 FOR D=1 TO 26'DEEX
210 IF A$=MID$(CD$,D,1)THEN
    A$=MID$(AL$,D,1):GOTO 230'HBCG
220 NEXT'BAEX
230 PRINT A$;:GOTO 190'CHYB
```

KIDS' CORNER

Continued from pg. 53

100

Here we build an ALPhabet $tring using the ASCII code.

110-170

This is Just Like the CoDe $tring builder in CYPHERIGHTER.

180-230

The only trick here is in our Comparison LooP (200-220). In Line 210 we first try to find a Duplicate of A$ (the CHaRacter we typed) in CD$. IF we *do* find a match, THEN we go to that same position in our ALPHabet $tring, change A$ into the DEcoded letter and GO TO our PRINT routine. If we do *not* find A$ in CD$, then we have typed someThing besides a letter and we just "fall through" to our PRINT line (230).

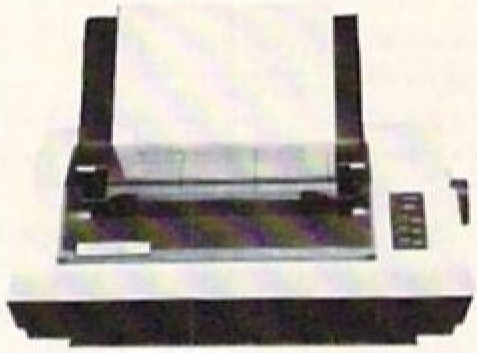
Now, to Make Sure your DECYPHERIGHTER is working Right, type in this Secret MESSage from your Cryptic friend, garrulous old Dr. Curryfavor:

```
10101010
FY MLI TCS GACJ DQFX
```

```
SLDA, XASJ C X.C.X.A.
DL JG. TIGGMYCNLG CSJ
QA PFRR CJJ MLIG SCZA
CSJ CJJGAXX DL QFX
VAS VCR YFRA CSJ XASJ
MLI C TLVM (PQAS FD'X
GACJM) XL MLI TCS XASJ
ZAXXCBAX DL YARRLP
(LG BCR) X.V.M.'X!
```

Kindly old Dr. Curryfavor has received a lot of Very Nice letters and phone calls from Silicon Panthers from All Over the country, asking him questions about all sorts of Things. One of the biggest problems that people seem to be having is in typing in the programs. The program LISTings that appear in this MagaZine do NOT lOOk like they do on the screen, beCause the Funny little Graphics CHaRacters that PRINT on the screen do not show up very well on paper, so we use words rather than symbols to make the LISTings easier to Read. This means that the little ReVerSe Heart that you see when you PRINT the "Shifted CLR/HOME" key (in quotes) is printed in the MagaZine as "[CLEAR]". Some of you have been typing in the words just like they are printed in the magaZine and you have been getting syntax errors. (On page is a "Key to Entering Program Listings" which you should read very carefully before typing in Any of these programs!)

bye, bye, for Now,
Dr. Petrie Curryfavor
CyberCryptographer and
Professor of ObFuscation



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Elite	9 x 8 + 1	96	60	12	1
Condensed	5 x 8 + 2	136	86	17	1
NLQ Mode:	NOTE: There is expanded (double-width) printing function in every character mode.				
Pica	9 x 16 + 3	80	25	10	2
Elite	9 x 16 + 1	96	30	12	2
Proportional	N x 16	—	—	—	2
Super/Subscript	5 x 8	136	43	17	2
Italic Cursive	12 x 16	80	25	10	2

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BY SHEILA NOOJIBAIL

Merlyn for the Commodore 64

In this game, you are transformed into the great wizard Merlyn of King Arthur's court. Nimue, an evil fairy aiming to lock you up for the rest of eternity in a crystal cave, is chasing you through an enchanted forest (Nimue is very inconspicuous, which is why you never see her). Your defenses are slowly weakening, but the process can be delayed by retrieving the bottles of magic potion that you earlier scattered among the trees in case of such an emergency. There are some boulders that block your path, but they can easily be disintegrated by your powerful fire balls. However, shooting at the boulders costs you points (this is to deter trigger-happy fingers).

You must collect as many bottles of potion as possible, because if you leave any, Nimue will take them for herself, weakening you further (you lose two points per bottle). If you don't think that you can get all of the bottles in the allotted time, you may use your transport spell, but you have only limited use of it. When this spell is enacted, you will instantly be transported out of the forest and all of your magic potion will disappear so Nimue cannot devour it. At the beginning of the game, you have three uses of this spell, but for every hundred points you earn, you receive another spell.

For a slightly greater challenge, omit the REM from line 130. This will blank the screen while the maze is being generated. To change the program so you begin each round by pressing the fire button instead of the space bar, change line 295 to WAIT 56464,16,16. You need a joystick in port two. When you come across an "*", don't go through it unless you wish to enact the transport spell. There are further directions within the program.

```
0 REM **** MERLYN ****'BOGB
1 POKE 53281,0:POKE 53280,0'CPLD
2 PRINT"[CLEAR,WHITE,DOWN11]";TAB(9);
  "JUST A SEC...[DOWN,LEFT7]
  SETTING UP CHARACTERS"'CEWQ
5 PRINT CHR$(142)'CFVF
10 POKE 52,48:POKE 56,48:CLR'DMNB
11 REM***BY SHEILA NOOJIBAL*******'BB
   JE
12 REM******2332 MARCY*************'BC
   AE
13 REM******EVANSTON ILL,
    60201***'BBYG
14 REM******312-866-8537**********'BCLG
15 REM********************************'
   BFWH
20 POKE 56334,PEEK(56334)AND 254'DQQD
30 POKE 1,PEEK(1)AND 251'DIBC
40 FOR I=0 TO 511:POKE I+12288,
   PEEK(I+53248):NEXT'IWNJ
50 POKE 1,PEEK(1)OR 4'DGCE
60 POKE 56334,PEEK(56334)OR 1'DORG
70 POKE 53272,(PEEK(53272)AND
   240)+12'EUBJ
80 FOR I=12552 TO 12559:READ A
   :POKE I,A:NEXT'GSFL
81 FOR I=12288 TO 12295:READ A
   :POKE I,A:NEXT'GSIM
82 FOR I=12784 TO 12791:READ A
   :POKE I,A:NEXT'GSKN
83 FOR I=12512 TO 12519:READ A
   :POKE I,A:NEXT'GSWO
84 FOR I=12776 TO 12791:READ A
   :POKE I,A:NEXT'GSLP
90 DATA 24,60,126,126,60,24,24,24'BABK
91 DATA 24,24,60,24,24,60,126,255'BAEL
92 DATA 0,24,36,36,24,0,0,0'BTVL
93 DATA 24,62,255,255,255,254,126,
   62'BDTN
94 DATA 0,0,0,16,16,56,56,56'BUKN
95 DATA 0,48,1,76,65,0,24,0'BTIO
96 DATA 68,149,1000,45,198,1000,68,
   149,1000,43,52,1000,45,198,250'BHEW
97 DIM QQ(15):FOR X=1 TO 15:READ QQ(X)
   :NEXT'GSQT
99 GOSUB 6000'BEHP
100 DIM A(3)'BEYV
110 A(0)=2:A(1)=-80:A(2)=-2
    :A(3)=80'GAOF
115 FOR I=3 TO 1 STEP-1
    :K=INT(RND(I)*I):SV=A(K):A(K)=A(I)
    :A(I)=SV:NEXT I'NMBS
120 WL=33:HL=32:SC=1024:A=SC+81
    :POKE 53280,13:POKE 53281,0'HOGK
130 PRINT"[CLEAR]":REM POKE53265,
    PEEK(53265)AND239'CDPG
140 FOR I=1 TO 23'DEGB
150 PRINT"!!!!!!!!!!!!!!!!!!!!!!!!!!!
    !!!!!!!!!!!!"'BAHG
160 NEXT I'BBCB
200 REM GENERATE MAZE'BMHA
210 POKE A,4'BDFX
220 J=INT(RND(1)*4):X=J'FKWD
230 B=A+A(J):IF PEEK(B)=WL THEN POKE
    B,J:POKE A+A(J)/2,HL:A=B
    :GOTO 220'MHDO
240 J=(J+1)*-(J<3):IF J<>X THEN
    230'JPFJ
250 J=PEEK(A):POKE A,HL:POKE A+53272,0
    :IF J<4 THEN A=A-A(J)
    :GOTO 220'LGKO
260 FOR DD=1 TO VAL(SL$)*RR'FKJH
270 XX=INT(38*RND(1)):YY=INT(22*RND(1)
    +1)'JUKN
272 IF PEEK(1024+XX+YY*40)<>32 THEN
    270'IRBO
275 POKE 1024+XX+YY*40,28
    :POKE 1024+XX+YY*40+54272,12
    :NEXT DD'KKCW
280 FOR DD=1 TO QQ'DFYH
281 XX=INT(38*RND(1)):YY=INT(22*RND(1)
    +1)'JUKP
282 IF PEEK(1024+XX+YY*40)<>32 THEN
    281'IRDP
285 POKE 1024+XX+YY*40,61
    :POKE 1024+XX+YY*40+54272,1
    :NEXT DD'KJYX
290 POKE 1065,32:POKE 1981,32
    :POKE 53280,7'DXTL
291 IF BB<0 THEN 295'DGGJ
292 XX=INT(38*RND(1)):YY=INT(22*RND(1)
    +1)'JUKR
293 IF PEEK(1024+XX+YY*40)<>33 THEN
    292'IRGR
294 POKE 1024+XX+YY*40,42
    :POKE 1024+XX+YY*40+54272,7
    :AS=1024+XX+YY*40'NTYD
295 GET S$:IF S$<>" "THEN 295'FIFP
296 POKE 53265,PEEK(53265)OR 16
    :POKE 53280,13'EYOS
297 POKE 53281,0:TI$="000000"'CLAQ
300 X=1065:P=30:GOTO 330'DNFB
310 W=0:C=NOT PEEK(56320)AND 15'FNFE
311 IF VAL(TI$)>=TT THEN 7000'FLSE
312 IF C=8 THEN W=1:GOTO 320'FIPE
315 IF C=1 THEN W=-40:GOTO 320'GJYI
316 IF C=2 THEN W=40:GOTO 320'FJEJ
317 IF C=4 THEN W=-1:GOTO 320'GIBK
318 IF(PEEK(56320)AND 16)=0 THEN
    GOSUB 3000'GQVM
319 GOTO 310'BDDI
320 IF PEEK(X+W)=61 THEN GOSUB 5502
    :P=P+5:PQ=PQ+1:GOTO 324'LYXL
321 IF PEEK(X+W)<>32 AND
    PEEK(X+W)<>42 THEN 310'LPXK
324 POKE X,32'BECE
325 IF PEEK(X+W)=42 THEN POKE X,32
    :POKE X+W,0:BB=BB-1:GOTO 501'LADQ
330 X=X+W:POKE X,0:POKE X+54272,3'FQEH
335 IF X=1981 THEN 500'DINI
340 GOTO 310'BDDC
500 ZX=QQ-PQ:ZX=ZX*2:P=P-ZX
    :IF P<0 THEN 7000'JYGL
501 PRINT"[CLEAR,DOWN7,WHITE]
    YOU ESCAPED"'BAVE
502 IF EP<=P THEN BB=BB+1
    :EP=EP+100'IQWK
505 PRINT"[YELLOW]YOUR SCORE IS [CYAN]
    ";P;"[WHITE]"'BDQK
506 PRINT"YOU HAVE ";'BBJI
507 PRINT;BB" TRANSPORT SPELLS
    REMAINING"'BDKP
510 X=1:POKE 54278,240'CMPD
515 POKE 54296,15:POKE 54276,17
    :POKE 54277,96'DBVM
520 H=QQ(X):X=X+1:L=QQ(X):X=X+1
    :D=QQ(X):X=X+1'JHRP
521 POKE 54273,H:POKE 54272,L'CPRG
522 FOR WW=D-50 TO D-20:POKE 54278,240
    :NEXT'HTFL
523 FOR WT=1 TO D:NEXT:POKE 54273,0
    :POKE 54272,0:POKE 54276,0'HEYO
524 IF X<16 THEN 515'DGMI
525 FOR TQ=1 TO 200:NEXT:POKE 54276,0
    :POKE 54273,0:POKE 54272,0'HGVQ
530 RR=RR+2:QQ=QQ+2'ELAH
531 TT=TT-10'CGOG
534 PQ=0'BDFH
535 GOTO 115'BDGI
2000 SL=2'BDFU
2001 RETURN'BAQU
3000 REM SHOT ROUTINE'BLRX
3001 P=P-5:IF P<0 THEN 7000'FKBB
3002 W=15-(PEEK(56320)AND 15)'EOVC
3004 IF W=1 THEN DI=-40:GOTO 3020'GLPF
3005 IF W=8 THEN DI=1:GOTO 3020'FKGF
3010 IF W=2 THEN DI=40:GOTO 3020'FLBB
3015 IF W=4 THEN DI=-1:GOTO 3020'GKSH
3016 GOTO 3002'BECD
3020 FF=X+DI:FC=FF+54272
     :GOTO 3022'FUGF
3021 POKE FF,32:FF=FF+DI:FC=FC+DI'FTKG
3022 IF PEEK(FF)=32 THEN 3027'EKED
3023 IF PEEK(FF)=28 THEN POKE FF,32
     :GOSUB 5000:RETURN'HRTH
3024 IF PEEK(FF)=61 THEN POKE FF,32
     :P=P-5:RETURN'IQJJ
3026 POKE FF,33:RETURN'CGYF
3027 POKE FF,62:POKE FC,7'CKPH
3029 GOTO 3021'BEDH
5000 REM FIRE SOUND'BJLA
5001 POKE FF,62:POKE FC,8'CKQB
5002 S=54272'BGJB
5004 FOR G=15 TO 0 STEP-1:POKE S+24,G
     :POKE S+4,129:POKE S+5,15
     :POKE S+1,40'NFFP
5005 POKE S,200:NEXT'CGYE
5006 POKE S+4,0:POKE S+5,0'EJFH
5011 POKE FF,32:POKE FC,0'CKFC
5012 RETURN'BAQA
5500 REM PICK UP BOTTLE SOUND'BRXH
5501 PQ=PQ+1'CFGF
5502 S=54272:FOR E=S TO S+28:POKE E,0
     :NEXT'HRUM
5504 POKE 54296, 15 :POKE 54277, 212
     :POKE 54278, 240'DDGN
5506 POKE 54276, 33 :POKE 54273, 123
     :POKE 54272, 135'DDXP
5508 FOR T=1 TO 30 :NEXT
     :POKE 54276, 32:FOR T=1 TO 20
     :NEXT'JUCT
5510 FOR E=S TO S+28:POKE E,0
     :NEXT'GKEJ
5512 RETURN'BAQF
6000 POKE 53281,0:POKE 53280,0'CPLC
6001 PRINT"[CLEAR,DOWN2]"TAB(17)"
     [WHITE]M[RED]E[CYAN]R[PURPLE]L
     [GREEN]Y[YELLOW]N[WHITE]"'CDCF
6005 PRINT"[DOWN3]IN THIS GAME YOU
     ARE MERLIN THE "'BARM
6007 PRINT"GREAT WIZARD OF KING
     ARTHUR'S COURT."'BAAP
6008 PRINT"YOU'VE TO COLLECT THE
     BOTTLES OF MAGIC"'BAMQ
6009 PRINT"POTION THAT YOU DROPPED
     WHEN FLEEING"'BACR
6010 PRINT"THE FAIRY NIMUE. YOU MUST
     HURRY THOUGH,"'BARK
6011 PRINT"BECAUSE IF NIMUE CATCHES
     UP WITH YOU"'BAJK
6012 PRINT"YOU'LL BE LOCKED UP IN THE
     CRYSTAL CAVE"'BAKL
6013 PRINT"FOR THE REMAINDER OF
     TIME."'BACJ
```

Continued on pg. 59

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```
6028 INPUT"[DOWN2]FURTHER
     INSTRUCTIONS ?";G$'BDFP
6029 IF G$<>"Y"THEN 6050'EGMN
6030 PRINT"[CLEAR,DOWN]
     USING A JOYSTICK IN PORT 2 YOU
     MUST "'BADL
6032 PRINT"MANUEVER MERLYN THROUGH
     THE FOREST."'BAQN
6033 PRINT"TO GET POINTS YOU PICK UP
     THE BOTTLES"'BAOO
6034 PRINT"SCATTERED THROUGHOUT THE
     MAZE."'BAIO
6035 PRINT"TO FIRE AT ROCKS BLOCKING
     YOUR WAY"'BAVP
6036 PRINT"PRESS THE FIRE-BUTTON AND
     MOVE THE"
6037 PRINT"JOYSTICK IN THE DIRECTION
     YOU WANT TO"'BASS
6038 PRINT"FIRE. SHOOTING AT THE
     BOTTLES COSTS YOU"'BAJU
6039 PRINT"10 POINTS BUT YOU START
     OFF WITH 3 FREE"'BAPU
6040 PRINT"SHOTS. YOU HAVE 3
     TRANSPORT SPELLS"'BAJM
6041 PRINT"BUT EARN MORE FOR EACH
     HUNDRED"'BABL
6042 PRINT"GET 100 PTS. GETTING
     CAUGHT IN THE MAZE"'BALO
6043 PRINT"AFTER YOUR TIME IS UP OR
     HAVING A SUB-";'BBQP
6044 PRINT"SCORE DROP BELOW 0 ENDS
     THE GAME"'BAQO
6045 PRINT"TO ACTIVATE TRANSPORT YOU
     MUST COLLECT":PRINT"THE *"'CBEU
6046 PRINT"IT TAKES A WHILE TO
     GENERATE THE MAZE"
     :PRINT"WHEN THE SCREEN";'CCSX
6047 PRINT"CHANGES FROM "
     :PRINT"[L. GREEN,RVS] [RVOFF,
     WHITE] TO [YELLOW,RVS] [RVOFF,
     WHITE] YELLOW":PRINT"USE THE";
     'DDDW
6048 PRINT"SPACE BAR TO BEGIN THE
     GAME":PRINT"PRESS SPACE BAR TO
     CONTINUE"'CBKA
6049 GET A$:IF A$<>" "THEN 6049'FJUQ
6050 PRINT"[CLEAR]"'BATE
6053 PRINT TAB(14)"SKILL[SPACE2]
     LEVELS"'CDTL
6055 PRINT TAB(14)"[DOWN2]
     TIME IN MAZE"'CDPN
6056 PRINT TAB(10) "[DOWN3]
     LEVEL 1 - TWO MINUTES"
6057 PRINT TAB(10) "[DOWN2]
     LEVEL 2 - 90 SECONDS"'CDXO
6058 PRINT TAB(10) "[DOWN2]
     LEVEL 3 - ONE MINUTE"'CDES
6059 PRINT TAB(10) "[DOWN2]
     LEVEL 4 - 30 SECONDS"'CDTS
6060 PRINT TAB(11)"[DOWN2]
     CHOOSE SKILL LEVEL"'CDPK
6065 GET SL$:IF VAL(SL$)<1 OR
     VAL(SL$)>4 THEN 6065'IUDS
6066 IF SL$="1"THEN TT=200'EIVO
6067 IF SL$="2"THEN TT=130'EIYP
6068 IF SL$="3"THEN TT=100'EIWQ
6069 IF SL$="4"THEN TT=30'EHCR
```

Continued from pg. 57

KIDS' CORNER

```
6070 BB=3:RR=5:EP=100:QQ=20'ESWM
6071 RETURN'BAQG
7000 PRINT"[CLEAR,DOWN,CYAN,DOWN2]
     TOO BAD...GAME OVER"'BAIF
7010 PRINT"[DOWN2,YELLOW]
     YOUR SCORE WAS ..."P'BBNG
7500 POKE 54296,15:POKE 54273,5
     :POKE 54272,71'DAKK
7510 FOR T=1 TO 900:NEXT:POKE 54276,0
     :POKE 54273,0:POKE 54272,0'HFWP
7515 POKE 54296,15:POKE 54277,53
     :POKE 54278,69'DBXR
7520 POKE 54276,33:POKE 54273,3
     :POKE 54272,244'DBBN
7525 FOR T=1 TO 900:NEXT:POKE 54276,0
     :POKE 54273,0:POKE 54272,0'HFWV
7530 POKE 54296,15:POKE 54277,53
     :POKE 54278,69'DBXO
7533 POKE 54276,33:POKE 54273,2
     :POKE 54272,163'DBAR
7536 FOR T=1 TO 900:NEXT:POKE 54276,0
     :POKE 54273,0:POKE 54272,0'HFWX
7537 FOR WW=1 TO 100:GET A$:NEXT'FKQT
7600 INPUT"[L. GREEN,DOWN4]
     PLAY AGAIN (Y/N)[SPACE2]?";
     Y$'BDPL
7800 IF Y$="Y"THEN PRINT"[CLEAR,WHITE]
     ":GOSUB 6053:P=0:GOTO 115'HOVP
7805 IF Y$="N"THEN END'ECWP
7807 GOTO 7600'BEKP
```

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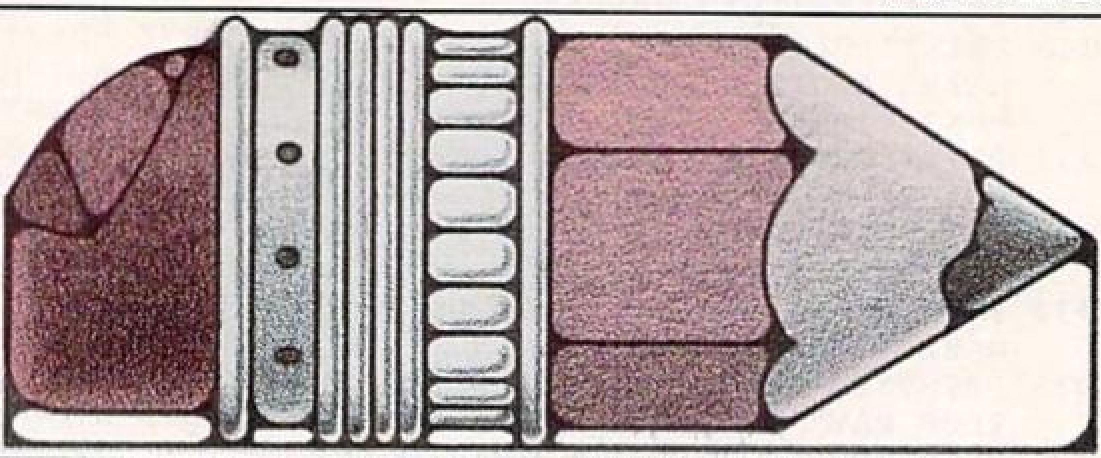
Circle Reader Service No. 28

BY DAVID MALMBERG

Using Joysticks in LOGO



This episode of our continuing study of Commodore's LOGO will concentrate on joysticks. First, we will introduce the fundamentals of LOGO joystick usage by developing a simple drawing program called JOYDRAW. This program is a LOGO equivalent of the popular toy Etch-A-Sketch and should be fun for LOGOphiles of all ages. Finally, we will present JOYDOODLER, a much more sophisticated joystick program. JOYDOODLER uses LOGO's list processing capabilities to actually create new LOGO procedures that can be run independently to redraw your joystick designs. In this way, JOYDOODLER lets you program in LOGO by just moving your joystick!

JOYDRAW

JOYDRAW is similar to INSTANTDRAW which was described in this column in the Fall 1983 issue of *Power/Play*. INSTANTDRAW controlled the turtle's drawing motion with the keyboard. If you have access to this Fall 1983 issue, you may wish to compare INSTANTDRAW and JOYDRAW to better understand the differences between keyboard and joystick control in LOGO.

JOYDRAW is simple to use. First, load Commodore's LOGO language. Then type in the JOYDRAW procedures below and save them. Plug a joystick into port two and type "JOYDRAW" to start the program. You will be able to move the turtle with the joystick. Whenever the joystick button is pushed, you will be drawing on the screen as the turtle moves. At any time you can change the turtle's drawing color by hitting one of the color keys on the top row of the keyboard. If you hit the zero key, you can erase whatever the turtle moves over by pushing the joystick button. You can also clear the screen and start a new drawing on a clean canvas by hitting the "C" key. The ">" and "<" keys will change the speed (and length) of the turtle's drawing stokes.

Using your joystick and LOGO you can draw pictures with your Commodore 64.

Now, let's get into the heart of JOYDRAW and see how it works. The main drawing procedure in JOYDRAW is called SKETCH and is:

```
TO SKETCH
  JOY. MOVE JOYSTICK 1
  IF JOYBUTTON 1 PENDOWN
    ELSE PENUP
  COMMAND
  SKETCH
END
```

The word JOYSTICK is a predefined LOGO routine (called a LOGO primitive). By using JOYSTICK 1 in the second line, we are telling LOGO that we wish to know the status of the joystick plugged into port two. Similarly, JOYSTICK 0 would request the status of port one's joystick. (Using port one is not recommended if you also wish to use the keyboard for input as we do in JOYDRAW.) Whenever you use the primitive JOYSTICK, Commodore LOGO returns an integer status value between minus one and seven. A value of minus one indicates the joystick is centered. A value of zero to seven indicates which direction the joystick is being pushed, with zero corresponding to up (or north), one being up and right (or northeast) and proceeding clockwise to seven which equates to up and left (or northwest).

The word JOYBUTTON in line 3 is another LOGO primitive. JOYBUTTON 1 returns a status of true if port two's joystick button is being pushed and false if the button is not being pushed. By using this true or false status, line 3 causes the turtle's pen to be down when the button is pushed and up otherwise.

Line 4 calls another procedure, named COMMAND, which will be explained shortly. Line 5 is a recursive call to execute the current procedure SKETCH again. Recursive calls like this are sometimes called infinite loops, because they cause the same parts of the program to be executed over and over. Recursion is a very important concept in LOGO. In the particular case of SKETCH, recursion is used to endlessly repeat the following activities: (1) move the turtle based on the joystick's direction, if any, (2) set the drawing pen up or down depending on the condition of the joy button and (3) execute commands from the keyboard if there are any.

Now, let's examine the procedures that perform these activities.

The JOY.MOVE procedure is where the joystick actually causes the turtle to move:

```
TO JOY.MOVE :DIRECTION
  IF :DIRECTION < 0 STOP
  SETHEADING :DIRECTION * 45
    FORWARD :STEP
END
```

This procedure requires an input called DIRECTION. This variable is set to the current status value of the joystick—because that is the value just after the call to JOY.MOVE in line 2 in SKETCH. Once JOY.MOVE has this input, it first tests to see if the status value is less than zero (i.e., a value of minus one, meaning the joystick is centered). If this condition is true, the STOP in line 2 is executed and the program flow returns to the calling procedure SKETCH.

If the joystick is currently being pushed in a direction and has a value between zero and seven, line 3 is executed and the turtle's heading is set to the compass degrees corresponding to the direction of the joystick. The turtle then moves forward a distance determined by the current

Continued on pg. 62

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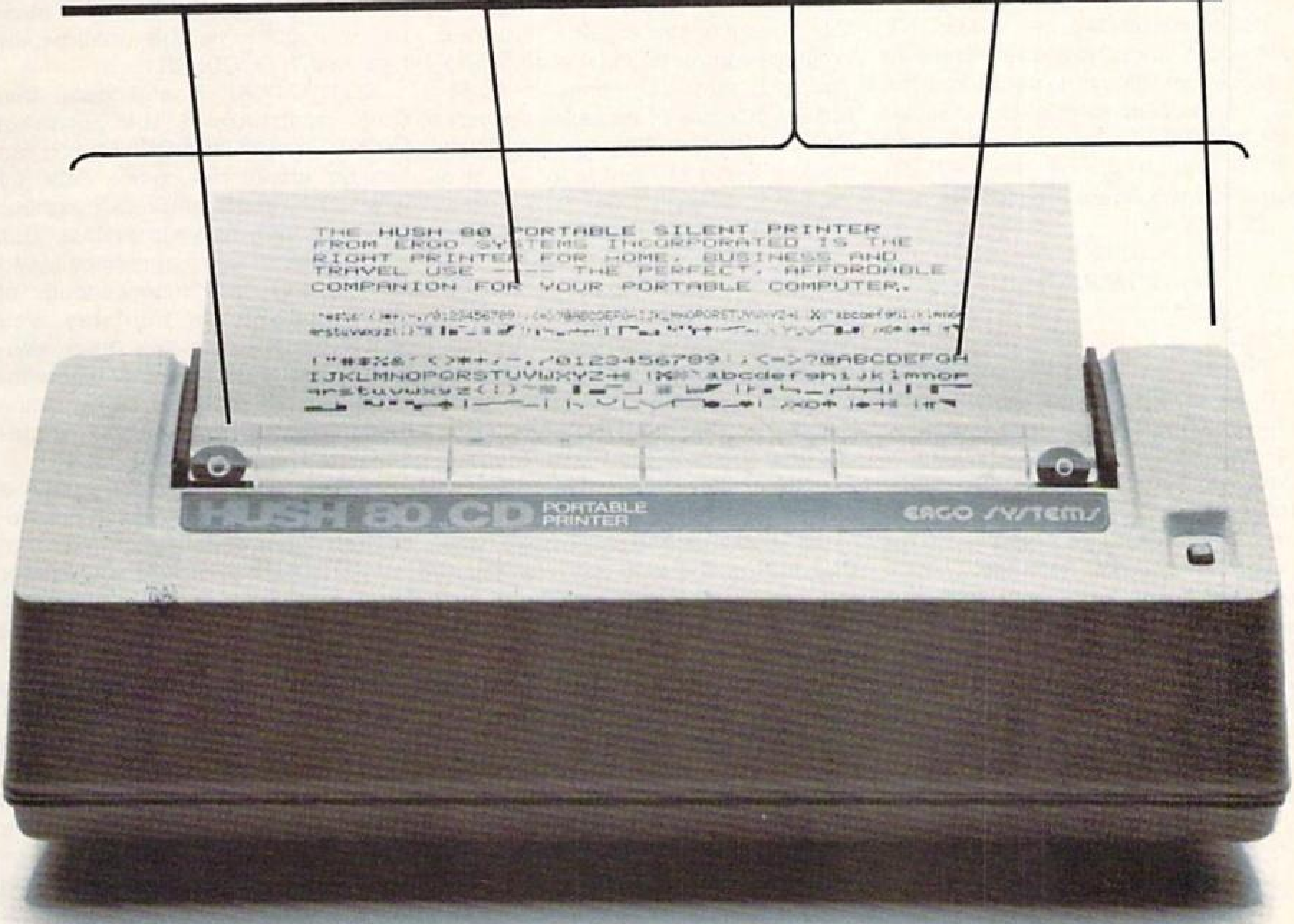

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NO MORE PENCILS

Continued from pg. 60

value of the variable STEP. The END in the last line returns program control to the calling procedure SKETCH just like STOP does in line 2.

Before we discuss the COMMAND procedure, it will be helpful to present a procedure that is the equivalent of a GET statement in BASIC—it allows the keyboard to be used for instant input without hitting the RETURN key. This procedure is as follows:

```
TO GET.KEY
   IF RC? OUTPUT
      READCHARACTER
   OUTPUT "
END
```

Whenever you want to get the image of a key that has been pressed, you would use a GET.KEY command in your LOGO program. This procedure will output the character image for the key, if one has been pressed and a null character otherwise. This procedure works because RC?, a predefined LOGO routine, outputs a value of true or false, indicating the presence or absence of a character in the keyboard buffer. If true, the OUTPUT READCHARACTER part of line 2 causes the character image to be output and the procedure is terminated since an output has been generated. If false, there is no character in the keyboard buffer and the third line outputs a null character.

Now, let's see how this procedure lets us give interactive commands from the keyboard while we are drawing with the joystick. This is done in the following procedure:

```
TO COMMAND
   MAKE "KEY GET.KEY
   CLEARINPUT
   IF :KEY = "STOP
   IF :KEY = "C SET.UP STOP
   IF :KEY = "> MAKE "STEP
      ( :STEP + 1 ) STOP
   IF :KEY = "< MAKE "STEP
      ( :STEP - 1 ) STOP
   TEST NUMBER? :KEY
   IFFALSE STOP
   PENCOLOR ( :KEY - 1 )
END
```

The second line of the procedure causes the variable called KEY to be the image of the key that has been pressed, if any. CLEARINPUT clears out the keyboard buffer so that multiple copies of the key image will not occur. The fourth command says, "If the current value of KEY is a null character then STOP this procedure." A STOP in LOGO is like a RETURN statement in BASIC. It returns the program logic to wherever it was before the current routine was called. In this instance, the STOP returns the program control to line 4 of SKETCH. The fifth and sixth lines of COMMAND increase or decrease the variable STEP depending upon whether the key being pressed is a ">" or a "<."

The TEST NUMBER? :KEY in the seventh line tests whether the key pressed is a digit from zero to nine. If it is, a truth flag is set to true. The next command then tests this flag and stops if it is false, i.e., the key is not a digit. Otherwise, the next command sets the PENCOLOR value to one less than the digit pressed. This formula makes the pen's color the same as the color keys on the top row of the keyboard. The only exception is that hitting the zero key will cause the pen to erase. (Actually, it will draw with the same color as the screen background.)

To add the finishing touches to JOYDRAW, we need two short procedures. The first is SET.UP which (1) clears the drawing screen (by using the LOGO primitive DRAW), (2) specifies that we want to draw using a palette with multiple colors (by using DOUBLECOLOR), (3) lets the turtle draw everywhere (by FULLSCREEN) and (4) initializes the variable STEP to four pixels or screen "dots." Specifically, we have:

```
TO SET.UP
   DRAW
   DOUBLECOLOR
   FULLSCREEN
   MAKE "STEP 4
END
```

The last procedure is called JOYDRAW and it is the one executed to start the entire program:

```
TO JOYDRAW
   SET.UP
   SKETCH
END
```

JOYDOODLER

The procedures for our second program, JOYDOODLER, are given in the listing. JOYDOODLER is both more complex and more capable than the program we have just considered. Yet, as you look at the JOYDOODLER listing, you will discover that many of the procedures have the same names and perform essentially the same functions as procedures in JOYDRAW. With some study and referral to the Commodore LOGO manual, you should be able to follow the logic of JOYDOODLER.

JOYDOODLER is a program that truly demonstrates the power of LOGO. Using JOYDOODLER, you can actually create the source code for new LOGO turtle graphics programs by simply moving your joystick. This LOGO source code can then be saved to disk and used independently of JOYDOODLER. In this way, you should be able to create some spectacular turtle graphic drawings without the need to make cumbersome calculations of distances, angles and/or screen coordinates.

JOYDOODLER is easy to use. Load Commodore's LOGO. Type in the procedures from the listing and save JOYDOODLER to disk so you'll never have to type it again. Plug your joystick into port two and type "JOYDOODLER" to begin the program. The screen will clear and the turtle will appear in its home position. As you move the joystick, the turtle will move on the screen.

In JOYDOODLER, you create your turtle graphic designs by drawing lines. Even a curve can be created by making a series of short connected line segments. The ends of the lines are determined by pushing the joystick button. For example, to draw your first line (1) move the turtle to one of the end points and hit the button, (2) hit the "D" key on the keyboard to put the pen down and (3) move the turtle to the other end and hit the button. JOYDOODLER will then draw the line.

After the line is drawn, the last end point will automatically become the starting point for the next line—so it is easy to draw designs using connected lines. To move without drawing (or to draw unconnected lines), just hit the "U" key on the keyboard to lift the turtle's pen up. The pen will stay up or down until the opposite command is entered by hitting the "D" or "U" key. So, if you wish to draw a series of connected lines, you only need to put the pen down once.

While you are making your joystick turtle graphics drawings, you may enter a number of useful commands by hitting single keys. Specifically, the commands available include:

0,1,2,3 ... 9 Keys: Change the pen color. Zero causes the pen to erase.

C Key: Clears the screen, homes the turtle and lets you start over.

U and D Keys: Set the turtle's pen up or down, respectively.

> and < Keys: Increase and decrease, respectively, the speed (and length) of the turtle's strokes.

N Key: Asks you for a name for the current design. A new LOGO procedure is then created with that name. That procedure will redraw the design whenever it is executed.

T Key: Lists the titles for the designs (procedures) you have created.

E Key: Executes a procedure of your choice to redraw a design at the current location of the turtle. For example, you might draw a house and name it "HOUSE" by using the "N" key. Then you could clear the screen with the "C" key to start a new drawing of several houses. You could move the turtle to where you want the first house, then hit "E", give the name "HOUSE" as the design you want to execute, move the turtle to where you want the second house and hit "E" again. This process could be repeated as many times as you want. You could use different colors for each house. The entire drawing could then be saved as a new procedure by hitting the "N" key and giving it the name "SUBURB."

S Key: Saves a copy of the picture on the screen to disk. It is saved as a "PICT" file, not as a LOGO source code file.

L Key: Loads a picture from the disk to the screen. This is the reverse of the "S" key operation.

O Key: Sets an origin for any drawing that follows by issuing a command to SETXY to the current coordinates of the turtle. You would use this command when you want a design to always be drawn in a specific and absolute location on the screen. Most simple designs will be done without setting an origin so that they can be redrawn in multiple locations by repositioning the turtle several times during the entire drawing process.

X Key: Sets an x-coordinate origin by issuing a SETX to the turtle's current x-coordinate.

Y Key: Sets a y-coordinate origin by issuing a SETY to the turtle's current y-coordinate.

Q Key: Quits the current drawing session and gives you an opportunity to save the procedures you have created with your joystick to disk. WARNING: If you answer yes to the question, "Do you wish to save your procedures?" JOYDOODLER will erase itself from the Commodore 64's memory and just leave your newly created procedures in memory. Be sure you have already saved a copy of JOYDOODLER to disk before you answer yes and JOYDOODLER self-destructs!!!

The best way to learn how all of these options work and how they can be used to create some great turtle graphic drawings is to just plug in your joystick, consult the above list and experiment. You will soon be a joystick expert and a turtle graphics artist extraordinaire. And you should have a lot of fun in the process. **C**

Program on next page

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```
TO JOYDOODLER
    MAKE "TITLES []
    INSTRUCTIONS
    JOYDRAW
END

TO INSTRUCTIONS
    CLEARTEXT CURSOR 10 0 PRINT [LOGO JOYSTICK DOODLER]
    CURSOR 12 2 PRINT [BY DAVID MALMBERG]
    CURSOR 1 4 PRINT [PLUG THE JOYSICK IN PORT2 AND CREATE!]
    CURSOR 6 6 PRINT1 [WOULD YOU LIKE INSTRUCTIONS?]
         MAKE "KEY FIRST.LETTER
    IF :KEY = "N STOP
    CLEARTEXT
    PRINT [LOGO JOYSTICK DOODLER ENABLES YOU TO]
    PRINT [DRAW USING THE JOYSTICK. WHILE YOU ARE]
    PRINT [DRAWING, YOU WILL ALSO BE CREATING LOGO]
    PRINT [PROCEDURES THAT WILL BE ABLE TO REDRAW]
    PRINT [YOUR DRAWINGS!!]
    PRINT []
    PRINT [USE THE JOYSTICK TO MOVE THE TURTLE]
    PRINT [AND THE JOY BUTTON TO SET THE END]
    PRINT [POINTS FOR YOUR LINES.]
    PRINT []
    PRINT1 [HIT RETURN TO CONTINUE] MAKE "KEY FIRST.LETTER
    CLEARTEXT
    PRINT [YOU CAN ALSO USE THE FOLLOWING KEYS:]
    PRINT [0,1,2,3...9 - TO CHANGE PEN COLOR]
    PRINT [U - PENUP]
    PRINT [D - PENDOWN]
    PRINT [> - TO INCREASE THE JOYSTICK STEPS]
    PRINT [< - TO DECREASE THE JOYSTICK STEPS]
    PRINT [C - TO CLEAR AND START A NEW DRAWING]
    PRINT [N - TO NAME AND DEFINE YOUR PROCEDURE]
    PRINT [T - LIST TITLES OF DEFINED PROCEDURES]
    PRINT [E - EXECUTE ONE OF THE PROCEDURES]
    PRINT [S - SAVE A PICTURE OF THE SCREEN]
    PRINT [L - LOAD A PICTURE TO THE SCREEN]
    PRINT [X - SETX TO CURRENT X COORDINATE]
    PRINT [Y - SETY TO CURRENT Y COORDINATE]
    PRINT [O - SETXY TO CURRENT COORDINATES]
    PRINT [Q - TO QUIT AND SAVE PROCEDURES]
    PRINT []
    PRINT1 [HIT RETURN TO CONTINUE] MAKE "KEY FIRST.LETTER
END

TO FIRST.LETTER
    MAKE "IMAGE REQUEST
    IF :IMAGE = [] OUTPUT []
    OUTPUT FIRST FIRST :IMAGE
END

TO JOYDRAW
    SET.UP
    SKETCH
END
```

Error - Does NOT Accept!
!

Cartoons by Brian Linn

```
TO SET.UP
    DRAW
    DOUBLECOLOR
    FULLSCREEN
    PENUP
    MAKE "PEN [UP]
    MAKE "STEP 4
    MAKE "HISTORY []
    MAKE "FLAG 1
END

TO SKETCH
    JOY.MOVE JOYSTICK 1
    IF JOYBUTTON 1 UPDATE.POINT
    COMMAND
    SKETCH
END

TO JOY.MOVE :DIRECTION
    IF :DIRECTION < 0 STOP
    SETHEADING :DIRECTION * 45 FORWARD :STEP
END

TO COMMAND
    MAKE "KEY GET.KEY
    CLEARINPUT
    IF :KEY = " STOP
    IF :KEY = "C SET.UP STOP
    IF :KEY = "> MAKE "STEP ( :STEP + 1 ) STOP
    IF :KEY = "< MAKE "STEP ( :STEP - 1 ) STOP
    IF :KEY = "U MAKE "PEN [UP] MAKE "HISTORY LPUT [PENUP] :HISTORY
         PEN.MESSAGE STOP
    IF :KEY = "D MAKE "PEN [DOWN] MAKE "HISTORY LPUT [PENDOWN]:HISTORY
         PEN.MESSAGE STOP
    IF :KEY = "S SAVE.SCREEN STOP
    IF :KEY = "L LOAD.SCREEN STOP
    IF :KEY = "N NAME.PROC STOP
    IF :KEY = "T TITLE.PROCS STOP
    IF :KEY = "E EXECUTE.PROC STOP
    IF :KEY = "Q QUIT STOP
    IF :KEY = "X MAKE "HISTORY LPUT ( SENTENCE [SETX] ROUND XCOR )
         :HISTORY XY.MESSAGE STOP
    IF :KEY = "Y MAKE "HISTORY LPUT ( SENTENCE [SETY] ROUND YCOR )
         :HISTORY XY.MESSAGE STOP
    IF :KEY = "O MAKE "HISTORY LPUT ( SENTENCE [SETXY] ROUND XCOR
         "( ROUND YCOR ") ) :HISTORY XY.MESSAGE STOP
    TEST NUMBER? :KEY
    IFFALSE STOP
    PENCOLOR ( :KEY - 1 ) MAKE "HISTORY LPUT ( SENTENCE [PENCOLOR]
         :KEY - 1 ) :HISTORY STOP
END

TO GET.KEY
    IF RC? OUTPUT READCHARACTER
    OUTPUT "
END
```

```
TO PEN.MESSAGE
    CLEAR.SPLIT
    PRINT SENTENCE [THE PEN IS NOW] :PEN
    WAIT 100
    FULLSCREEN
END

TO CLEAR.SPLIT
    CLEARTEXT
    SPLITSCREEN
END

TO WAIT :Q
    IF :Q = 0 STOP
    WAIT :Q - 1
END

TO SAVE.SCREEN
    CLEAR.SPLIT
    PRINT [WHAT DO YOU WANT TO CALL THIS SCREEN?]
    MAKE "NAME FIRST REQUEST
    SAVEPICT :NAME
    FULLSCREEN
END

TO LOAD.SCREEN
    CLEAR.SPLIT
    PRINT [WHAT SCREEN WOULD YOU LIKE TO LOAD?]
    MAKE "NAME FIRST REQUEST
    READPICT :NAME
    FULLSCREEN
END

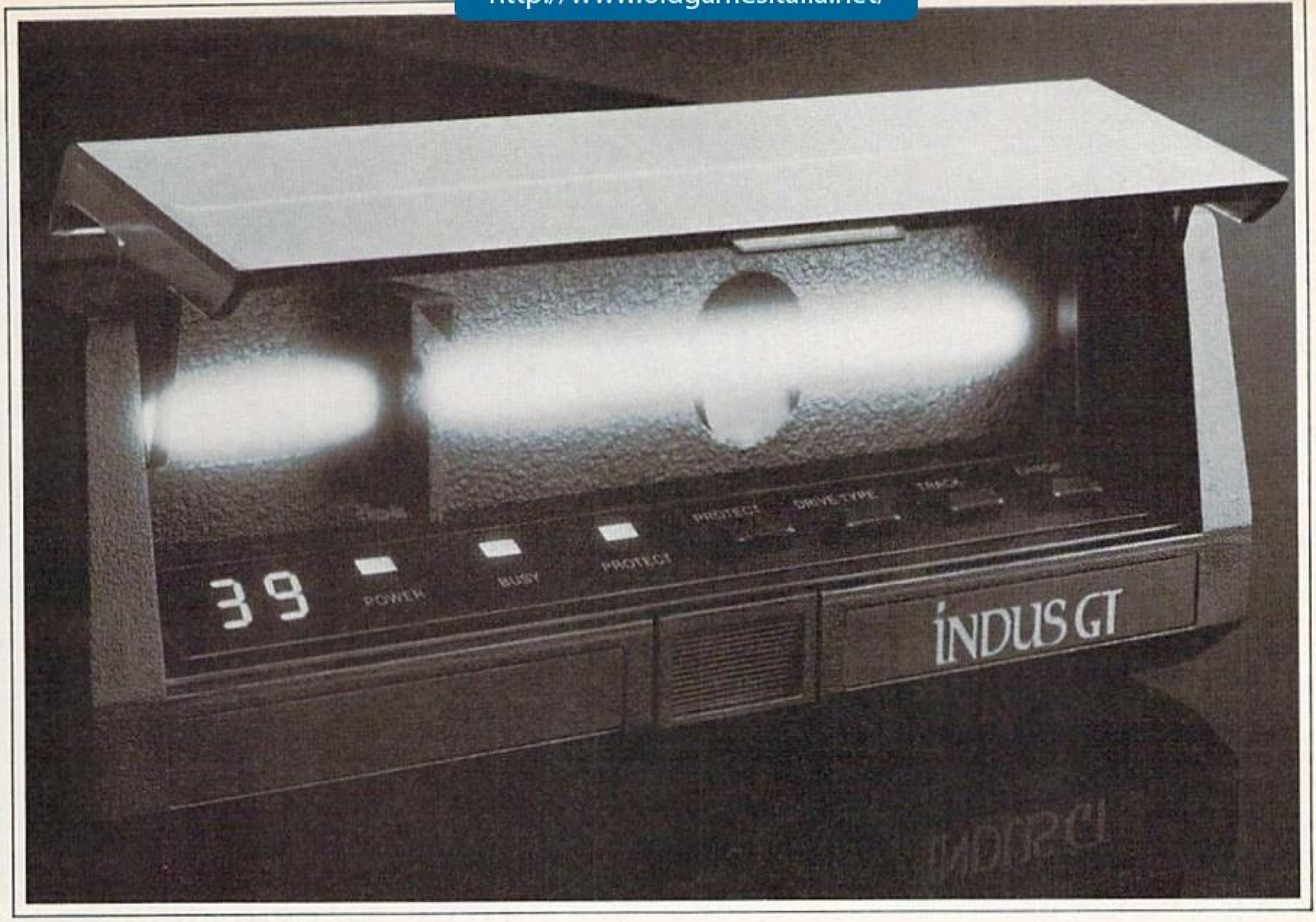
TO NAME.PROC
    CLEAR.SPLIT
    PRINT [WHAT DO YOU WANT TO NAME THIS DESIGN?]
    MAKE "NAME FIRST REQUEST
    DEFINE :NAME ( FPUT [] :HISTORY )
    MAKE "TITLES LPUT :NAME :TITLES
    MAKE "HISTORY []
    MAKE "FLAG 1
    .GCOLL
    FULLSCREEN
END

TO TITLE.PROCS
    CLEAR.SPLIT
    IF EMPTY? :TITLES PRINT [YOU DON´T HAVE ANY PROCEDURES, YET!]
    IF NOT EMPTY? :TITLES PRINT [YOU HAVE THE FOLLOWING PROCEDURES:]
         PRINT :TITLES
    PRINT1 [HIT RETURN TO CONTINUE]
    MAKE "KEY FIRST.LETTER
    FULLSCREEN
END

TO EXECUTE.PROC
    CLEAR.SPLIT
    PRINT [WHAT PROCEDURE DO YOU WISH TO EXECUTE?]
```

Wa-da-ya Mean "Does not Accept?!?" There is no such Error Message!!

How'd ya like a Swim in the pool, hugh? How'd you accept that?!



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```
    MAKE "NAME FIRST REQUEST
    FULLSCREEN
    RUN SENTENCE :NAME []
    MAKE "HISTORY LPUT ( SENTENCE :NAME [] ) :HISTORY
    PENUP
END

TO QUIT
    CLEAR.SPLIT
    PRINT [DO YOU WISH TO SAVE YOUR PROCEDURES?]
    PRINT [WARNING: THIS WILL DESTROY JOYDOODLER!]
    MAKE "KEY FIRST.LETTER
    IF :KEY = "Y ERASE.DOODLER
    NODRAW
    CLEARTEXT
    TOPLEVEL
END

TO ERASE.DOODLER
    NODRAW CLEARTEXT PRINT [NOW SAVE YOUR PROCEDURES TO DISK]
    ERASE [WAIT CLEAR.SPLIT XY.MESSAGE PEN.MESSAGE HYPOTENUSE
          INSTRUCTIONS JOYDRAW JOYDOODLER SKETCH SQUARE FIRST.LETTER]
    ERASE [QUIT EXECUTE.PROC TITLE.PROCS NAME.PROC LOAD.SCREEN
         SAVE.SCREEN SET.UP GET.KEY COMMAND UPDATE.POINT]
    ERASE [JOY.MOVE ERASE.DOODLER] TOPLEVEL
END

TO XY.MESSAGE
    CLEAR.SPLIT
    PRINT [X AND/OR Y IS NOW SET]
    WAIT 100
    FULLSCREEN
END

TO UPDATE.POINT
    MAKE "NEWX ROUND XCOR
    MAKE "NEWY ROUND YCOR
    IF :FLAG = 1 MAKE "OLDX :NEWX MAKE "OLDY :NEWY
         MAKE "FLAG 0 STOP
    SETXY :OLDX :OLDY
    MAKE "A ROUND TOWARDS :NEWX :NEWY
    MAKE "L ROUND HYPOTENUSE
    IF :PEN = [DOWN] PENDOWN
    SETHEADING :A FORWARD :L
    MAKE "HISTORY LPUT ( SENTENCE [SETHEADING] :A
         [FORWARD] :L ) :HISTORY
    PENUP
    MAKE "OLDX :NEWX
    MAKE "OLDY :NEWY
END

TO HYPOTENUSE
    OUTPUT SQRT ( ( SQUARE ( :NEWX - :OLDX ) )
         + ( SQUARE ( :NEWY - :OLDY ) ) )
END

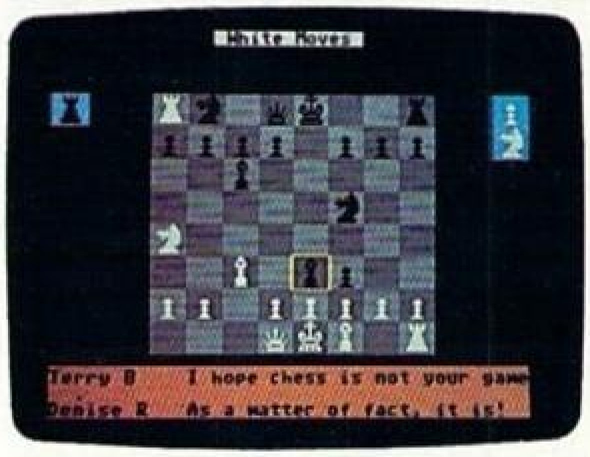
TO SQUARE :SIDE
    OUTPUT :SIDE * :SIDE
END
```

ACCEPTS!
Prg:OK.
Beep!
Ding! Ding! Ding!
Tweeeeee
Whew!
I'm not gonna Pull that one again!!
B.L.

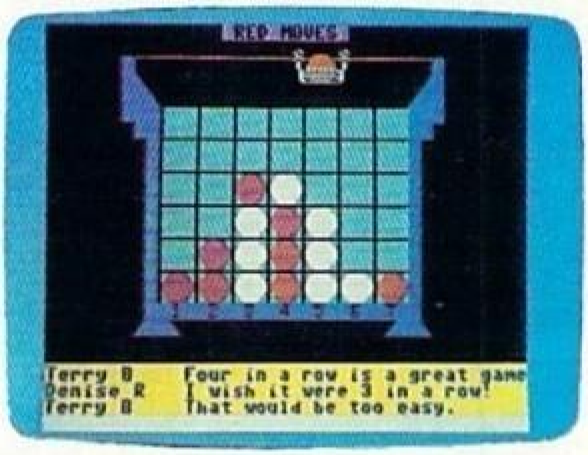
BY WALT LOUNSBERY

Playnet, A True Story

A telecommunications network dedicated solely to games? Our undercover investigator scopes it out and discovers that, using your Commodore 64 and modem, you can play games with people from all over the country via the Playnet network.



Terry B   I hope chess is not your game
Denise R   As a matter of fact, it is!



Terry B   Four in a row is a great game
Denise R   I wish it were 3 in a row!
Terry B   That would be too easy.

It was the town of Hershey, in Pennsylvania. A resort town much like any other, except that everywhere you went there was chocolate for sale. Big bars, small bars, kisses, even some of the streetlights looked like big chocolate kisses. Only today, the air was charged with electricity instead of the aroma of cocoa. My assignment: to infiltrate a gathering of computer nuts in the chocolate town, to see if the early extraordinary reports were true.

1:47 PM: I arrive at the Commodore Users Fair of the Mid-Atlantic Regional Commodore Association (MARCA). After registering at the desk, it takes a half hour to make my way to the Playnet booth through the dense crowd. Warily, I case the area.

2:12 PM: It is obvious that this is going to be a tough one. It would be necessary to enter the booth and wait for the right moment. In the meantime, I could get evidence for my report. I jostle my way to the first terminal in the booth. In the crowd, it is easy to disguise hitting the elbow of the child working with the machine. Startled, he turns around.

"Just who do you think you are?" he says. He looks about twelve years old and more knowledgeable about computers than I feel. "Joe," I reply. "Joe Friday." The kid grins. "Well, you're one day late, Joe," he says. "Today is Saturday!".

I decide to change the subject. "Just what are you doing on that screen?" I ask innocently. Of course, I had done my research back at headquarters.

"Well, I just finished playing Sea Strike with Tim and I've returned to the reception area to see if anyone would like to try some Lightning Checkers," he tells me. "Watch this, I'll try to get someone to play." He types a few words into the machine. Somebody called "Denise R" pursuades him to play chess instead. Quickly I take out my micro-camera and shoot a picture of the screen. This would look good in my report!

"Is it always this easy to start a game on Playnet?" I ask. "Sure," he says. "Right now there are hundreds of people that are subscribing to Playnet. They say that there should be over 5000 by the end of the year. We can communicate all over the country via the Telenet telecommunications service, which has local phone numbers in hundreds of cities. There are a lot of other games, too. There is Reversi, Capture the Flag and Four-In-A-Row. There are new games coming out later, like Dungeons and Dragons, Scrabble, Hearts, Cribbage and Chinese Checkers."

"How do they get such good color pictures over the telephone lines?"

The kid starts to look smug. "It's really neat. They give you the software for the network and the games on a floppy disk. Then your computer handles the graphics and talks to the other person's computer playing the same game. When Playnet comes out with a new game, you just download the new games on your Playnet disk. Great, huh?"

I struggle to remember the dossier. "Uh, that means the central Playnet computer just handles the communications?"

"Didn't you read the brochures? They've got an online newsletter and electronic mail. Later on there will be bulletin boards, special interest groups, electronic file transfer, game tournaments and all sorts of things."

"How much does all this cost?"

"The initial membership is $49.95 and the online charge is only $2 per hour. There's also a monthly fee of $6. It's really reasonable compared to the teletext services that don't have graphics or sound or the ability to talk while you're playing the games. In fact, sending messages to my friends over Playnet costs less than calling them long distance."

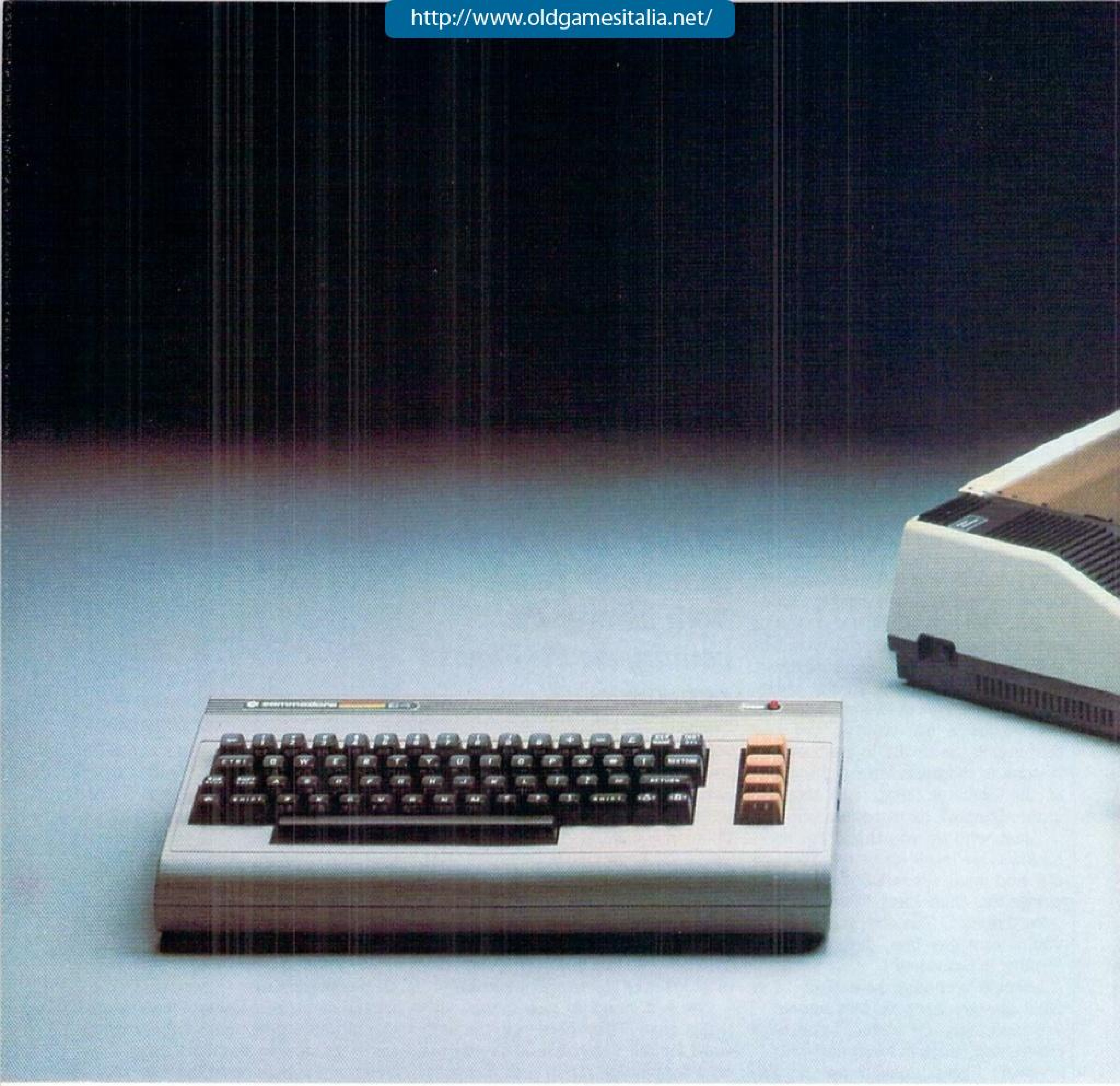
My head is beginning to spin with all the possibilities. It wouldn't do to let the smart brat know. I have to ask the ultimate question. "OK, so if you know so much about teletext, why don't you subscribe to that?"

"I used to belong to some of the other nets," he says, "but they were just a drag."

That is just too disgusting for me. "Kid, you talk too much!" I snarl at him before throwing an old lady out of her chair and sitting down before the second computer. There is still some time left.

Of course, it would be too easy to let on. I had studied the dossier very carefully, but the distractions had blocked my memory a bit. The worst distraction had been the sight of the kid holding two conversations and wiping out his chess opponent at the

Continued on pg. 72



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Introduction into the 6502/6510machine language for the BASIC programmer.
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(Source code and object code)

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(BASIC, FORTH, and machine language programs)

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This book contains the listings of many programs that turn your C-64 into a powerful business computer. The programs range from depreciation calculations over mortgage calculations to a complete business package with invoice writing, mailing list and inventory control working together. 121 pages, ISBN 3-88963-186-X.
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29 Programs for the Commodore-64/264
This book contains the listings of a variety of programs for your C-64/264 computer. The programs range from several games over a powerful sprite editor to 3-D plot and forecasting of future events. 148 pages.
ISBN 3-88963-055-3.
Order-No. 55 (Book) $ 9.95
Order-No. 4705 (Disk) $ 19.95

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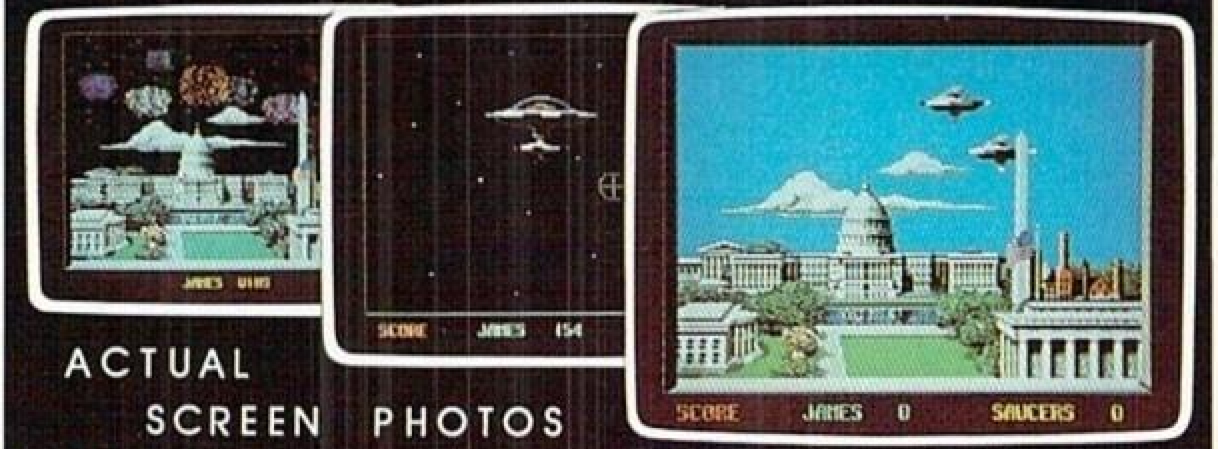

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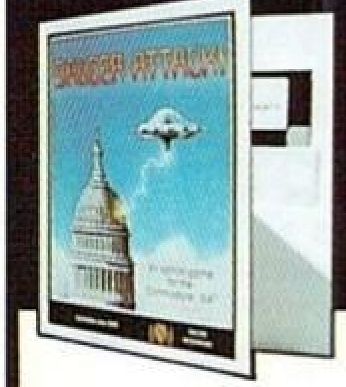

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TELE/SCOPE

Continued from pg. 69

same time. But I get everything under control and relax while playing Four-In-A-Row.

The kid hadn't known that the Playnet folks were planning on introducing an electronic computer store with some fascinating aspects. Besides being able to download software directly, the subscribers will be able to upload their own programs to the store, setting their own price. This will provide automatic and direct distribution and royalties! Naturally, programs or files will be put online for free or for a very small downloading charge as well.

Even though Playnet is exclusively for the Commodore 64 now, expansion to other computer models is being planned for early 1985. This will surely be plenty to keep the subscribers, and that brat in particular, very happy with a wide spectrum of services. I can even remember the toll-free number to call about Playnet: 1-800-PLAYNET.

5:55 PM: It has been a while since the warning went out over the loudspeakers. In a few moments the Fair will be closed for the day. It is time to bring an end to the hunt and close in on the quarry. Everyone is too busy checking the MARCA booth for their names on the prize drawings list to pay attention to me. I stand up and approach the person using the third computer on Playnet. There is no doubt he is the right man. I haven't seen another three hundred-pound discus thrower all day.

"Boris," I say, "I am Joe Friday from the State Department. It's time to go." He stands up without a word and turns to me. Despite having defected to the United States several days earlier, this Olympic contender still does not show the effects of a poor diet. Boris Grottag does not look like he needs any protection from the minions of Baklava. Luckily, his passion for games had kept him at the Playnet booth while we made our preparations.

His demeanor is stern, but all of a sudden he breaks into a loud guffaw. In between gasps, he gets the words out. "Vell, I am glad you fenally gott heir, Cho! Yu are vone day late, Meister Freiday!"

Somehow I know it is going to be one of those weekends. C

CHRISTMAS BUYERS GUIDE:

Games for the Commodore 64

Data for this chart was supplied by MENU, a data base provided by the International Software Database Corporation. For further evaluative information and ordering, contact the International Database Corporation, 1520 South College Avenue, Fort Collins, CO 80524. The toll free number is 1–800–THE–MENU or 303–482–5000 (in Colorado or outside the U.S.)

Program Name:	Publisher:	ISPN:	Description:
Acti-Fantasy Ver-1.0	SEI Enterprises Inc.	69087-050	Adult group fantasy coordination program.
Acti-Fun	SEI Enterprises Inc.	69087-100	Fun and play coordination program.
Acti-Play	SEI Enterprises Inc.	69087-200	Activity coordination program.
Acti-Tale	SEI Enterprises Inc.	69087-300	Enter tales into computer.
Acti-Truth	SEI Enterprises Inc.	69087-400	Enter major-truths.
Action Writer	Codewriter Corporation	13337-100	Write unique arcade games.
AE	Broderbund Software	08850-010	Fight attacking sting rays.
Aegean Voyage	Spinnaker Software	75300-025	Sail vessel in quest of treasures.
Air Rallye	Human Engineered Software	36550-010	Cross-country air race.
Alien Addition	DLM Teaching Resources	26493-075	Practice basic addition facts.
Alley-Oops	Artworx Software Company	05437-025	Fight diabolical creatures.
Alligator Mix	DLM Teaching Resources	26493-125	Alligators in swamp.
Ankh	Datamost	23700-010	Solve puzzles through logic, destruction and scientific method.
Apple Cider Spider	Sierra On-Line	69925-010	Arcade game.
Aquaplane	Quicksilva Inc.	64456-150	Ski through marine maniacs, G & T's and regattas.
Argos Expedition	CBS Software	11670-025	Transform computer into spaceship console.
Avengers	Commodore Business Machines	13950-070	Destroy attacking aliens with laser cannons.
Bandits	Sirius Software	70775-100	Shoot bandits to protect supplies.
Baron	Blue Chip Software	07970-050	Real-estate market simulation.
Battle for Normandy	Strategic Simulations Inc.	76500-025	Recreate massive allied invasion of Northern France.
B. C. Quest for Tires	Sierra On-Line Inc.	69925-015	Watch Thor ride his wheel.
Beyond Castle Wolfenstein	The Muse Company	55850-130	Sequel to Castle Wolfenstein.
Bike Story Ver-1	E. David Associates	27325-050	Teaches bike safety.
Blackjack Tutor	Briley Software	08475-090	Play a solid game of blackjack.
Blade of Blackpoole	Sirius Software	70775-150	Illustrated adventure game.
Blue Max	Synapse Software	77500-050	World War I flying ace game.
Blueprint	Commodore Business Machines	13950-090	Build machine from part maze.
Boulder Dash	Micro Labs	50500-070	Make way through underground caves.
Break Street	Creative Software	20600-060	Popular trend of break dancing.
Bridge Ver-4.0	Artworx Software	05437-050	Bid for the contract and play out the hand.
Bruce Lee	Datasoft Inc.	23850-125	Relive the power of Bruce Lee.
Bugaboo	Quicksilva Inc.	64456-180	Jump your way of caves with Bugaboo the Flea.
B-1 Nuclear Bomber Ver-40003	Avalon Hill Game Company	06350-050	Pilot your B-1 on a mission over the Soviet Union.
Castle Wolfenstein	The Muse Company	55850-150	Adventure game demands fast thinking and quick response.
C'est La Vie	Adventure International	01650-175	Pick money off street and try to amass a fortune.
Championship Golf	Hayden Software Company	34925-011	Golf simulation.
Chatterbee	Tronix Publishing	82787-025	Spelling teacher which uses S.A.M.
Chinese Juggle	Creative Software	20600-065	Balance dishes using joystick.
Choplifter!	Broderbund Software	08850-050	Control helicopter to rescue hostages.
Circus	Comm*Data Computer House Inc.	13850-175	Educational/recreational graphic adventure.
Circus Charlie	Parker Brothers	59759-025	Circus music and graphics.
Clowns	Commodore Business Machines	13950-110	Action under the big top.
Coast-to-Coast America	CBS Software	11670-125	Five geography games in one.
Coco-Notes	CBS Software	11670-130	Catch notes, create melodies, fish for tunes.
Combat Leader	Strategic Simulations Inc.	76500-070	Arcade-like graphics and action.
Computer Baseball	Strategic Simulations Inc.	76500-250	Simulation of a baseball game.
Computer Baseball 1982 Team Data & Stat Compiler	Strategic Simulations Inc.	76500-280	Update major league matchups for 1982 AL and NL teams.
Computer Football Strategy Ver-41501	Avalon Hill Game	06350-150	Call the plays in game of head-to-head strategy.
Conan	Datasoft Inc.	23850-135	Recent release.

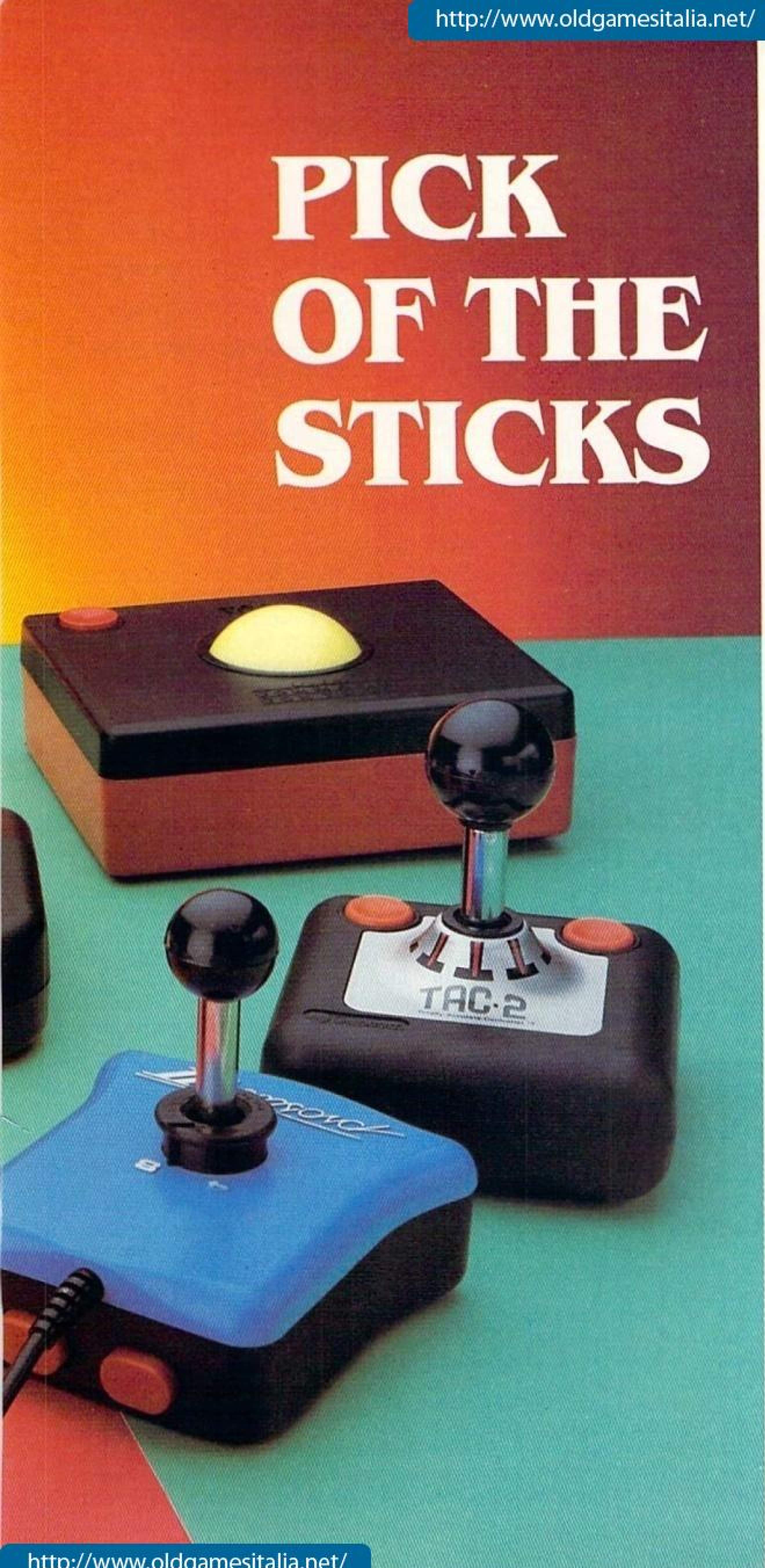
Program Name:	Publisher:	ISPN:	Description:
Conquering the Commodore 64 Kingdom: 25 Games.	Prentice-Hall Inc.	61925-125	Popular games such as space, adventure and strategy.
Cribbage	Abacus Software	00337-150	Card game.
Crime Stopper	Hayden Software Company	34925-015	Assume role of private eye.
Critical Mass	Sirius Software	70775-250	Illustrated adventure game.
Crystal Caverns	Hayden Software Company	34925-016	Find priceless treasure.
Cutthroats	Infocom Inc.	37413-015	Stranded on island.
Cyborg Ver-3.2A	Sentient Software Inc.	69250-200	Science fiction text adventure.
C-64 Arcadepack I	Comm*Data Computer House Inc.	13850-155	Recreational games.
Dallas Quest	Datasoft Inc.	23850-140	Help Sue Ellen defeat JR.
David's Midnight Magic	Broderbund Software	08850-060	Feel of real pinball machine.
Deadline	Commodore Business Machines Inc.	13950-120	Real-life adventure.
Death in the Caribbean	Micro Labs	50500-135	More than 100 graphic screens.
Demolition Division	DLM Teaching Resources	26493-175	Practice basic division.
Dictionary Skills	Right On Programs	66450-170	Listing as it would appear in dictionary.
Dino Eggs	Micro Labs	50500-145	Save dinosaurs from extinction.
Dinosaurs	Advanced Ideas Incorporated	15700-140	Transport prehistoric animals into modern times.
Dragon Mix	DLM Teaching Resources	26493-200	Multiplication and division.
Dragonhawk	Creative Software	20600-075	Adventure and strategy game.
Dragonsden	Commodore Business Machines Inc.	13950-130	Battle giant spiders, bats and the dragon.
Drelbs	Synapse Software	77500-325	Defeat trollaboars.
Drol	Broderbund Software	08850-065	Rescue children in lost civilization.
Ducks Ahoy	CBS Software	11670-140	Transport ducks.
Dungeon of the Algebra Dragon	Timeworks Inc.	82000-150	Develop algebra skills.
Eagles	Strategic Simulations Inc.	76500-614	Fly biplanes.
Educational Contract Bridge	Barclay Bridge Supplies	06850-100	Learn the game of bridge.
Eliza Ver-3.0	Artificial Intelligence	05412-100	Artificial intelligence demonstration.
Enchanter	Infocom Inc.	37413-025	First of a spellbinding series.
Ernie's Magic Shapes	CBS Software	11670-150	Identify shapes and colors.
Famous Names in Software Games	Leisure Genius	44262-100	Computer versions of the Scrabble, Mastermind and Kensington board games.
Final Conflict	Hayden Software Company	34925-022	Play against computer or human opponent.
Flak	Funsoft Inc.	31672-100	Year is 2086 and the universe is threatened by computer takeover.
Flight Simulator II	SubLogic Corporation	76950-215	Control engine aircraft with full flight instrumentation.
Flying Ace Ver-45302	Avalon Hill Game Company	06350-525	Control a World War I bi-plane on a mission.
Fort Apocalypse	Synapse Software	77500-425	Maneuver your helicopter through a deadly maze.
Fortress	Strategic Simulations Inc.	76500-620	Tactical conquest and fortification.
Frogger	Sierra On-Line Inc.	69925-180	Move your frog across rivers and streets.
Frogger II: Three Deep!	Parker Brothers	59759-040	Expanded version of Frogger.
Fur Trapper	Briley Software	08475-240	Deductive explorer series.
Gelfling Adventure	Sierra On-Line Inc.	69925-190	Game based on Muppet movie.
Germany 1985: The Second Edition	Strategic Simulations Inc.	76500-628	NATO forces must repel Soviet invasion of W. Germany.
Ghost Manor/Spike's Peak	Human Engineered Software	36550-040	Save friend from Dracula and conquer mountain.
Go	Hayden Software Company	34925-023	Computer adaptation of ancient oriental strategy game.
Golden Baton	Comm*Data Computer House Inc.	13850-295	Educational/recreational adventure game.
Gorf	Commodore Business Machines Inc.	13950-300	Four space action games.
Gridrunner	Human Engineered Software	36550-050	You against enemy droids.
Gridrunner II	Human Engineered Software	36550-060	Sequel to Gridrunner.
Gumball	Broderbund Software	08850-081	Graphic and unique game play.
Gwendolyn	Artworx Software Company Inc.	05437-100	Princess Gwendolyn is kidnapped.
Gypsum Caves	Adventures Inc.	01678-100	Timing, common sense and concentration.
Halftime Battling Band	CBS Software	11670-160	Stage own be-bop bowl half-time show.
Heathcliff	Datasoft Inc.	23850-175	Excellent reading and spelling practice.
Heist (The)	Micro Labs	50500-225	Arcade game takes you through an entire museum.
HES Games 84	Human Engineered Software	36550-075	Takes you to the 1984 Summer Olympic Games.
High Seas	Briley Software	08475-300	Deductive explorer series.
Highrise	Micro Labs	50500-230	Hand/eye coordination and shape perception.
Holidays and Festivals	Right On Programs	66450-290	National holidays celebrated in the USA.

Program Name:	Publisher:	ISPN:	Description:
In Search of the Most Amazing Thing	Spinnaker Software	75300-300	Game of negotiation.
Infidel	Infocom Inc.	37413-030	Adventures of explorer in Egyptian desert.
Institute	Screenplay	68843-100	Escape from institute.
International Soccer	Commodore Business Machines Inc.	13950-320	Realistic player and ball movement.
Jack Attack	Commodore Business Machines Inc.	13950-360	Sixty-four different screens.
Jawbreaker	Sierra On-Line Inc.	69925-270	Arcade game.
Jawbreaker II	Sierra On-Line Inc.	69925-275	Follows the original Jawbreaker.
Juice	Tronix Publishing Company	82787-200	Build circuit boards.
Juno First	Datasoft Inc.	23850-180	Defend the solar system.
Jupiter Lander	Commodore Business Machines Inc.	13950-370	Space landing simulation.
Jury Trial II	Navic Software	56281-500	Courtroom strategy game.
Kickman	Commodore Business Machines Inc.	13950-380	Ride unicycle and catch falling objects.
Kid Grid	Tronix Publishing Company	82787-100	Connect dots.
King Cribbage	Hayden Software Company	34925-025	Classic card game.
Knights of the Desert	Strategic Simulations Inc.	76500-632	Joust with armored tanks.
Lazarian	Commodore Business Machines Inc.	13950-390	Rescue, evade and destroy the one-eyed Leviathan.
Lazer Maze Ver-1	Avant-Garde Creations	06400-298	Conflicts are settled in mirrors.
Le Mans	Commodore Business Machines Inc.	13950-400	Multi-obstacle road racing.
Learning with Leeper	Sierra On-Line Inc.	69925-310	Practice sessions in math, reading and writing.
Letter-Man	Behavioral Engineering	07275-100	Typing game reminiscent of Pacman.
Light Waves	CBS Software	11670-175	Adventure game in which players construct own rules of play.
Lode Runner	Broderbund Software	08850-089	Design your own game screens.
Lost Tomb	Datasoft Inc.	23850-185	Descend into lost tomb infested with deadly creatures.
Mabel's Mansion	Datamost	23700-055	Avoid deadly creatures and ghosts.
Man Copter	Datasoft Inc.	23850-190	Recent release.
Mansion	Briley Software	08475-450	Deductive detective game.
The Mask of the Sun	Broderbund Software	08850-093	Search ruins for mask of gold.
Matchboxes	Broderbund Software	08850-095	Match pairs of identical characters.
Math Invasion Games	Setzer Educational Service	69325-200	Ten arcade type games.
Maze Master	Human Engineered Software	36550-242	Seek villain.
Midway Campaign Ver-40102	Avalon Hill Game Company	06350-700	Naval engagements.
Millionaire	Blue Chip Software	07970-100	Stock market simulation.
Millionwaire	Brainbank Inc.	08412-175	High stakes game.
Miner 2049er	Reston Publishing Company Inc.	66187-140	Control Bounty Bob.
Miner 2049er II	Micro Labs	50500-307	Sequel to Miner 2049er.
Minnesota Fats' Pool Challenge	Human Engineered Software	36550-245	Electronic Pool Game.
Minus Mission	DLM Teaching Resources	26493-325	Destroy large green blobs with laser beam.
Mission-64	Briley Software	08475-465	Enemy spacecraft threaten rescue mission.
Montezuma's Revenge	Parker Brothers	59759-075	Develop basic game skills.
Mothership	Softsync Inc.	72240-420	Three-dimensional game.
Motorcross	Tronix Publishing Company	82787-225	Surge onto course.
Mr. Do	Datasoft Inc.	23850-250	Recent release
Movie Musical Madness	CBS Software	11670-450	Make own movies.
Moviemaker	Reston Publishing Company Inc.	66187-150	Become the Director.
Moviemaker: For the Commodore 64	Prentice-Hall Inc.	61925-150	Total animation series.
Meteor Multiplication Disintegrate	DLM Teaching Resources	26493-300	Disintegrate meteors moving toward a star station.
Museum	Briley Software	08475-480	Deductive detective game.
Music Box	Human Engineered Software	36550-250	Rid universe of evil.
Mychess II	Datamost	23700-060	Two or three dimensions on five chess boards.
Mystery Murder: Murder by the Dozen	CBS Software	11670-500	Deductive reasoning.
Necromancer	Synapse Software	77500-460	Liberate humanity.
Neutral Zone	Access Software Inc.	00525-100	Go to outer edges of galaxy.
Night Mission Pinball	SubLogic Corporation	76950-450	Pinball arcade simulation.
Oil's Well	Sierra On-Line Inc.	69925-520	Many levels of challenge.
Omega Race	Commodore Business Machines Inc.	13950-510	Eliminate droid forces.
On Court Tennis	Gamestar Inc.	32262-075	Realistic sports and strategy.
On Field Football	Gamestar Inc.	32262-080	Realistic sports and strategy.

Program Name:	Publisher:	ISPN:	Description:
Operation Whirlwind	Broderbund Software	08850-099	Command battalion in World War II.
Pentagon	Briley Software	08475-510	Deductive detective game.
Perseus and Andromeda	Comm*Data Computer House Inc.	13850-605	Educational/recreational graphic adventure.
Pharaoh's Curse	Synapse Software	77500-540	Find ancient fortune.
Pinball Spectacular	Commodore Business Machines Inc.	13950-290	Real pinball action and thrills.
The Pit	Human Engineered Software	36550-290	Tunnel beneath alien planet in search of jewels.
Planetfall	Infocom Inc.	37413-050	Set in future universe.
Pokersam	Tronix Publishing Company	82787-240	Play poker and converse with S.A.M.
Polar Pierre	Datamost	23700-065	Surmount obstacle course.
Pool	Abacus Software	00337-520	Bring the billiard parlor to your home.
Popeye	Parker Brothers	59759-100	Become Popeye.
Presidential Campaign	Timeworks Inc.	82000-310	Conduct nationwide campaign.
The Privacyteers Ver-1.0	Little David Enterprises Inc.	45075-100	Identify threats to personal privacy and freedom.
The Privacyteers-2 Ver-1.0	Little David Enterprises Inc.	45075-200	Search matches for the Privacyteers program.
Professional Golf Tour	Strategic Simulations Inc.	76500-648	Tee off against the masters.
Protector II	Synapse Software	77500-500	Alien slimehordes are attacking your cities.
Purple Turtles	Quicksilva Inc.	64456-480	Fully animated arcade game with loveable turtles and cuddly graphics.
Quizagon	Counterpoint Software Inc.	20025-500	Trivia game with over 6,000 questions.
Quintic Warrior	Quicksilva Inc.	64456-500	Sinister crabmen and a doomed city.
Race for the States	Blue Sky Software	07977-250	Attempt to become President.
Radar Rat Race	Commodore Business Machines Inc.	13950-550	Beat the maze.
Ranch	Spinnaker Software	75300-375	Animated western adventures.
RDF 1985	Strategic Simulations Inc.	76500-665	U.S. rapid deployment force.
Repton	Sirius Software	70775-400	Help Captain Star save Repton.
Rescue Squad	The Muse Company	55850-460	Player maneuvers ambulance through traffic.
Reversal	Hayden Software Company	34925-038	Computer adaptation of strategy game Othello.
Ring of Power	Quicksilva Inc.	64456-500	Find the jewels, be proclaimed king.
Ringside Seat	Strategic Simulations Inc.	76500-675	Two-player and computer-as-opponent boxing game.
Robbers of the Lost Tomb	Timeworks Inc.	82000-350	In search of the sacred tablets.
Rootin' Tootin'	Human Engineered Software	36550-275	Control a tuba in music maze.
Run for the Money	Scarborough Systems Inc.	95709-070	Fast action of electronic arcade games.
S.A.M.	Tronix Publishing Company	82787-275	Software Automatic Mouth.
Sargon II	Hayden Software Company	34925-042	Seven levels of play.
Sargon III	Hayden Software Company	34925-041	Opening library of over 68,000 moves.
Seafox	Broderbund Software	08850-150	Command a submarine.
Seahorse Hide 'N Seek	CBS Software	11670-550	Travel to shipwreck hideaway.
Seastalker	Infocom Inc.	37413-065	Monster attacking research station.
Seawolf	Commodore Business Machines Inc.	13950-560	Classic two-player sea battle.
Sentinel	Synapse Software	77500-550	Vague uneasiness stirs instrumentation.
Serpentine	Broderbund Software	08850-200	Many levels of playing ability.
Seven Cities of Gold	Electronic Arts	28512-100	Trade with natives and search for gold.
Shamus	Synapse Software	77500-600	Sleuth adventure game.
Shrooms	Blue Sky Software	07977-300	Inner earth spiders capture humans.
Short Circuit	Micro Labs	50500-345	Doomsday bomb protected by 12 fuses.
Silly 64	Blue Sky Software	07977-350	Exploit power of Commodore 64.
Skier-64	Abacus Software	00337-610	Test skills on slopes.
Slalom	Tronix Publishing Company	82787-250	Take a deep breath and you're off.
Slamball	Synapse Software	77500-650	User functions as the pinball.
Solar Fox	Commodore Business Machines Inc.	13950-590	Fast-paced arcade game.
The Solar System	Right On Programs	66450-620	Basic concepts of planets.
Solitaire	Blue Sky Software	07977-400	Standard Las Vegas-style solitaire.
Sorcerer	Infocom Inc.	37413-070	Mystical clue and a magical tour.
Sorceror of Claymorgue Castle	Adventure International	01650-690	Become apprentice to wizard.
Space Gunner	Blue Sky Software	07977-450	Defend the planet.
Space Taxi	The Muse Company	55850-530	Pilot flying taxi.
Space Train	Blue Sky Software	07977-500	Space train is invading the planet.
Spare Change	Broderbund Software	08850-350	Surprises galore.
Spellbound	Timeworks Inc.	82000-360	Educational spelling game.

Program Name:	Publisher:	ISPN:	Description:
Spy Vs Spy	First Star Software Inc.	30838-100	Strategic challenges.
Squire	Blue Chip Software	07970-200	Financial planning simulation.
Star Battle	Timeworks Inc.	82000-370	Save earth from the infamous Scyons.
Star League Baseball	Gamestar Inc.	32262-100	Baseball animation.
Star Ranger	Commodore Business Machines Inc.	13950-610	Fight hordes of space enemies.
Star Wars: The Arcade Game	Parker Brothers	59759-200	Excitement of space adventure.
Starbowl Football	Gamestar Inc.	32262-200	Realistic gridiron and lifelike animated players.
Starcross	Commodore Business Machines Inc.	13950-620	Travel through the mystery ship and meet alien friends and foes.
Starpost	Commodore Business Machines Inc.	13950-630	Protect the star post.
Sting	Quicksilva Inc.	64456-675	Fight off invading swarms, battle the bees and defend the queen.
Strip Poker	Artworx Software Company Inc.	05437-450	Settle in for a sizzling evening of strip poker.
Suicide Strike	Tronix Publishing Co/Monogram	82787-300	Risk life to destroy enemy's secret headquarters.
Super Zaxxon	Human Engineered Software	36550-285	Enhanced version of original game.
Supermash	Commodore Business Machines Inc.	13950-650	Raquetball arcade classic.
Survivor	Synapse Software	77500-725	Multi-player cooperative space adventure.
Suspended	Commodore Business Machines Inc.	13950-660	Solve varied and original puzzles to save your planet.
Sword of Fargoal	Epyx Computer Software	29575-750	Adventure game with graphics
T.A.C. (Tactical Armor Command)	Avalon Hill Game Company	06350-890	Control individual tanks, anti-tank guns and infantry squads.
Telengard Ver-424	Avalon Hill Game Company	06350-910	Fifty-level dungeon adventure game.
Temple of Apshai	Epyx Computer Software	29575-800	Labyrinth filled with treasures, 30 monsters and over 200 rocks.
Ten Little Indians	Comm*Data Computer House Inc.	13850-775	Educational/recreational graphic adventure.
Terminal Zone	Cyberia Inc.	21400-250	Game of skill and precision.
Tetrad	Hayden Software Company	34925-460	Three-dimensional tic-tac-toe game.
T.G.I.F. (Thank Goodness It's Friday) Ver-45701,53	Avalon Hill Game Company	06350-920	Typical week in working class.
Thunderbolt	Cyberia Inc.	21400-275	Fast-action, three-dimensional game.
Tigers in the Snow	Strategic Simulations Inc.	76500-688	Battle of Bulge.
Timebound	CBS Software	11670-925	Search for quarry in 11 categories of history.
Tooth Invaders	Commodore Business Machines Inc.	13950-670	Teaches good dental care.
Touring Ver-1	E. David & Associates	27325-500	Map skills exercise for children.
Triad	Commodore Business Machines Inc.	13950-680	Position yourself on the tic-tac-toe grid.
Trivia Flight	Mark of the Falcon	47225-100	Challenge of over 4,000 questions.
Tune Trivia	Sight & Sound Music Software I	69937-500	Challenge even best music trivia buff.
Tycoon	Blue Chip Software	07970-300	Commodity market simulation.
Type Attack	Sirius Software	70775-500	Fast action typing arcade game.
Vaults of Zurich	Artworx Software Company Inc.	05437-500	Dare to undertake boldest heist of the century.
Voice Chess	Softsync Inc.	72240-720	Computerized chess play with a voice.
Wall Street	Timeworks Inc.	82000-400	Game of financial speculation.
Wargle	Hayden Software Company	34925-480	Maze game featuring seven playing fields.
Waterline	Tronix Publishing Co/Monogram	82787-400	Navigator mistook iceburg for Pittsburgh.
Weather Tamers	CBS Software	11670-950	Computerized map of North America.
Webster: The Word Game	CBS Software	11670-960	Recognize and spell familiar words.
Witness	Infocom Inc.	37413-090	Detective era of the thirties.
Wizard of Akyrz	Comm*Data Computer House Inc.	13850-815	Educational/recreational graphic adventure game.
Wizard of Wor	Commodore Business Machines Inc.	13950-720	Fight your way through mazes.
Wizard of Words	Advanced Ideas Incorporated	15700-900	Five different word games.
Wizware-Agent USA	Scholastic Inc.	68075-300	Cross country train chase.
Wizware-Bannercatch	Scholastic Inc.	68075-400	Conversion of binary numbers.
Wizware-Spelldiver	Scholastic Inc.	68075-500	Ocean floor visualizes letters and words.
Word Challenge	Hayden Software Company	34925-490	Computer adaptation of famous word game Boggle.
Zarcon	Blue Sky Software	07977-550	Defend yourself from the Zarcon fleet.
Zork I	Commodore Business Machines Inc.	13950-740	Find treasure and escape.
Zork II	Commodore Business Machines Inc.	13950-750	Find treasure and secret places.
Zork III	Commodore Business Machines Inc.	13950-760	Discover the dungeon master's secret purpose.
32 Basic Programs for the Commodore 64	Dilithium Press Software	25900-130	Practical applications, educational uses, games and graphics.
50 Mission Crush	Strategic Simulations Inc.	76500-010	Pilot bomber of World War II.

SLIK STIK



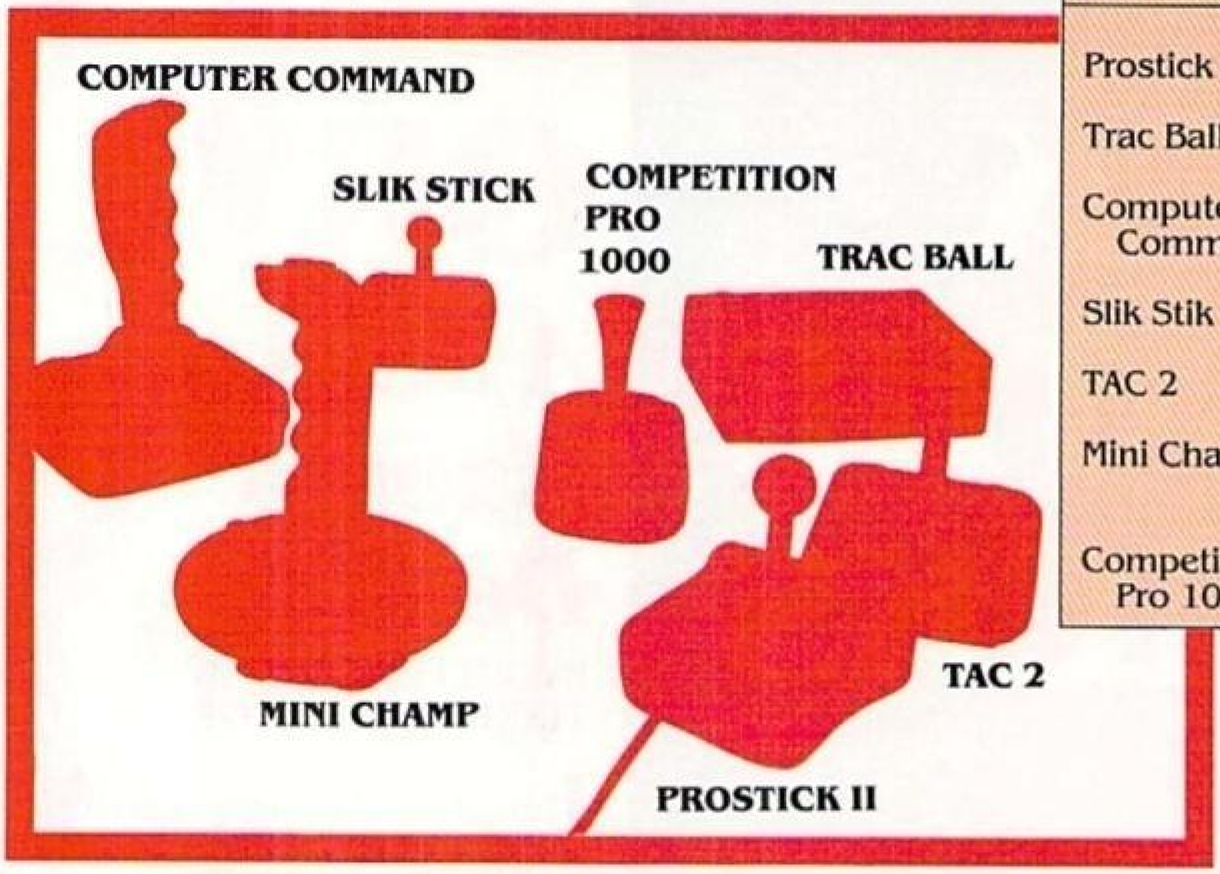
PICK OF THE STICKS

OR A Joystick Named Desire

BY JIM GRACELY,
TECHNICAL EDITOR

It starts out very subtly, a shot missed here, a quick chance at a bonus lost there, then… suddenly, in the middle of your best game of *Beach Head* yet, just as you're about to blow apart the battle fortress, the big gun is zeroing in on you, you press the fire button and…nothing!! You press it again and get nothing again as the big gun blows you away. Alas, your game is through. You have just experienced a minor case of joystick failure (an acute case would involve the stick snapping off—not as uncommon as it may sound!).

HENRI MEILLIER



Joystick	Manufacturer	Warranty
Prostick II	Newport Controls	5 years
Trac Ball	Wico	1 year
Computer Command	Wico	1 year
Slik Stik	Suncom	90 days
TAC 2	Suncom	2 years
Mini Champ	Championship Electronics	90 days
Competition Pro 1000	Coin Controls	2 years

Is there such a thing as an indestructible joystick? Will a $50 joystick guarantee 5,000 points added to all of your game scores? Is there any difference at all among joysticks? Which one is best for you? These questions, and more, will be tackled in this look at seven popular joysticks.

I put each of the joysticks through the same set of tests. These tests included timed mazes, speed-sticking and two games.

Mazes

There were three mazes used: horizontal, vertical and diagonal. The object of these tests was to maneuver an object through the maze as quickly as possible, while avoiding the walls. The score was a combination of the time required to complete the maze plus a penalty for the number of times the walls were hit. Each maze test was run three times for each joystick and the scores averaged. The lower scores, as shown in Table 1, are the best.

These tests provided an evaluation of defined directional control of the joystick. The Competition Pro was dominant in all three maze types, taking first in both the horizontal and diagonal and second in the vertical. Each move felt precise and exact and the scores reflected this. The TAC 2 was also strong in the mazes taking first place in the vertical maze. The Prostick II took second place in the diagonal maze. The Trac Ball had the slowest times and the Mini Champ had the most penalty points.

The overall ranking in the maze tests found the Competition Pro 1000 in first, with the Prostick II in second and the TAC 2 in third.

Speed Sticking

This was a variation on the maze tests. Targets appeared at random locations on the screen and the object was to touch these targets as quickly as possible. This test was run three times with each joystick, also with the times averaged.

This test provided an evaluation of random directional control of the joystick. As you can see in Table 1, the Trac Ball came out far ahead in this test with the Slik Stik and Competition Pro second and third. The slowest time in this test was turned in by the Computer Command.

Games

The two games used for testing were the beginner level of *Neutral Zone* by Access Software and the Trap Shooting portion of *Summer Games* by Epyx. Both games were chosen for the lack of a lethal enemy. All scores were accomplished by joystick dexterity and not because of aliens randomly missing or hitting. These were the first tests that required use of the fire button and the scores also reflect the position and quality of the button. Each game was played three times and the scores averaged for the total.

In *Neutral Zone*, the speed of the joystick is limited by the game, however, the horizontal positioning of the joystick must be very precise, with the ability to make minor corrections. The fire button is used but there is no absolute time limit on aiming and firing. The Slik Stik gave both the highest average and the highest one game score (890,000). Second place was a tie between the Trac Ball and the Prostick II. The worst average went to the Mini Champ.

In Trap Shooting, the joystick manuevering required includes both speed and precision. Although precise control is necessary, the time allowed for gaining that control and firing a shot in only a fraction of a second. Fire button control was much more important in this game because only one shot is allowed per target; a touchy or stiff button would affect the score greatly. The Slik Stik again gave the highest average score and the highest individual game score (21). The Competition Pro was second and the TAC 2 third. Lowest score (6) and average was a tie between the Mini Champ and the Computer Command.

The overall game averages put Slik Stik at number one, Competition Pro at two and the Trac Ball at three, as shown in Table 1.

Totals

To find a total score for each joystick, I used points based on the best score. The joystick with the best overall score for the maze, speed sticking and game tests was awarded

Joystick	Maze Total	Maze Points	Speed Sticking Total	Speed Sticking Points	Game Total	Game Points	Grand Total Points
Prostick II	5704	91.6	5034	79.9	162	81	252.5
TAC 2	5765	90.7	4951	81.3	179	89.5	261.5
Slik Stik	7532	69.4	4456	90.3	200	100	259.7
Computer Command	8174	63.9	5893	68.3	139	69.5	201.7
Trac Ball	10688	48.9	4027	100	183	91.5	240.4
Mini Champ	8722	59.9	4881	82.5	138	69	211.4
Competition Pro 1000	5230	100	4738	84.9	189	94.5	279.4

Table 1

100 points. Every other joystick was awarded a number of points equal to the percentage of its score as compared to number one. These three scores were added together for a possible total of 300 points. The joysticks were then ranked using this score.

The results? The Competition Pro 1000 came in first place, over ten points above the number two finisher. Number two was the TAC 2 joystick and number three the Slik Stik.

What does this mean? Well, it all depends upon what you want in a joystick and the games you play.

Which Joystick is for You?

If you look at Table 2, you will see the wide variance in the ranking of the joysticks within each of the three sets of tests. The Trac Ball moved from dead last in the mazes to number one in the speed tests. The Slik Stik, which dominated the game scores was only the fourth best when it came to mazes. This variance can be used as a guide for selecting a particular joystick for your own use.

The maze tests are pretty representative of games such as *Oil Wells*, *PacMan*, *Wizard*, *Jumpman* and *Lode Runner*. These games all require precise left-right, up-down moves with as much speed as possible. If these are your favorite games, then the Competition Pro or the Prostick II may be the joystick for you.

The speed test scores are a good indication of the overall maneuverability of the joystick. Although this can be used along with either the maze or game scores, there is a separate set of games which this specifically applies to. Games such as *Archon*, *Triad*, *Omega Race*, *Necromancer* and *Star Trek* are good examples of this sort of game.

I want to make a couple of comments about the Trac Ball here. A trac ball is not an appropriate controller for all joystick games. I tried using it for *International Soccer* and all I managed to get was sore fingers. On the other hand, I used it for *Rug Rider* (a new game from Tri-Micro) and *Space Taxi* and more than doubled my high scores on each! The reason I did so well in these games was that they required a very light, precise touch of the joystick and more importantly, once my player started moving, it would continue moving unless I changed direction. This saved my fingers a lot of wear and tear.

There are two points to remember about the Trac Ball. The first is that the ball must be moving for the computer to see a direction. If you want to move left, you must keep rolling the ball left until you get where you want to be. The second point is that it is very hard to move in only one direction (up, down, left or right). This is because the two shafts in the trac ball rest against the ball at perpendicular angles. It is very hard to roll the ball forward without putting at least a little sideways motion on it.

Table 2

Joystick	Overall Ranking	Points	Percentage of 300	Weighted %	Maze Ranking	Speed Ranking	Game Ranking
Competition Pro 1000	1	279.4	93.1%	100%	1	3	2
TAC 2	2	261.5	87.1%	93.5%	3	5	4
Slik Stik	3	259.7	86.5%	92.9%	4	2	1
Prostick II	4	252.5	84.1%	90.3%	2	6	5
Trac Ball	5	240.4	80.1%	86%	7	1	3
Mini Champ	6	211.4	70.4%	75.5%	6	4	7
Computer Command	7	201.7	67.2	72.1%	5	7	6

If you find a game that allows you to work within these points, you'll find that the Trac Ball is an excellent replacement for a joystick. Some other games it would help you improve are *Blue Max, Beach Head, Beyond Castle Wolfenstein,* and *Zaxxon.*

Now, back to the game test scores. The game tests would represent the games that require both manueverability and some precise horizontal and vertical control. Besides the two games used, others that would fall into this category would be *Star Ranger, Repton, Fort Apocalypse* and *Genesis.*

Competition Pro 1000

The Competition Pro joystick was a late entry into this testing. I had never seen it until someone handed me one for this article. My first impression was that with a two-year warranty, there must be something good about it.

This is a light plastic joystick with rounded rectangular base and a unique stick design. The best description of the shape of the stick would be an ice cream cone. The box calls the stick "ergonomic handle design—user friendly," but most people who use the joystick find it a little uncomfortable, although it does seem that it would fit a small hand. That is my only complaint about this joystick.

At the front of the base is a red curved fire button a little over two inches long. The curved, long fire button is to allow either left- or right-handed play with only one button. Under the front of the joystick is a finger ledge. This ledge allows your index finger to firmly support the front of the joystick, providing both leverage for the stick and access to the fire button.

Internally, this joystick uses very good quality leaf switches and has a rubber collar at the base of the stick to maintain center position.

Overall, the Competition Pro is a joy to play with. The control is very precise and accurate and short quick moves are just as easy as long, smooth moves. This is apparent in the maze tests where it consistently scored highly.

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Competition Pro 1000

TAC 2

This is a heavier plastic joystick with a rounded square base and a ball-stick design. The base is almost two inches high and is a little bulky to hold comfortably. The stick is a short metal shaft with a rather large ball on top. The base of the joystick curves up to help support the bottom of the stick and prevent snappage.

At the front of the base are two round, red fire buttons. The buttons are recessed so that you must actually push them down into the base to activate them. The fire buttons are very noisy on this joystick. Although such audible feedback from the fire button can be an advantage, the volume of the clicks can mask the sound from the game. I found this to be the case in Trap Shooting, where only one shot is allowed and only the noise of the shot verifies that you have made your shot.

Overall, this joystick is very good. It is a better joystick for maze games and places where smoothness is required rather than speed and precision. This comes from the fact that it battled for first in the maze tests but fell to fourth and below in the speed sticking and games.

Slik Stik

This is a small, light plastic joystick with a rounded square base and a small ball-stick design. The base is only about 2.5 inches square and fits easily into the hand. The stick is a short rubber stub with a small plastic ball on top. The stick meets the base with a plastic-to-plastic edge.

At the left front of the base is a small round red fire button. Like the TAC 2, this button is also recessed into the base; however, it is very quick and quiet. The fire button on the left would be a disadvantage for anyone who holds the joystick in their right hand (this is not necessarily a left-handed person. I'm left-handed and hold the joystick in my left hand).

This is a no-frills, fast, responsive joystick which is great for games requiring speed, mobility and a quick fire button. This joystick outscored all the others in the two games that I used for the test and had the highest single game score in both. The disadvantage of this joystick is the lack of precision. The maze tests showed this, in which the Slik Stik was a far-behind fourth—almost 20 points behind the third-place joystick. Another consideration is the fact that it only has a 90 day warranty.

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Slik Stik

Prostick II

This is a medium-sized high-impact plastic joystick with an almost square base. The first distinction claimed by the Prostick II is a cool blue base. The base flares out a little on the sides that would be toward the wrist. This is apparently to fit around the base of the thumb and make the joystick easier to hold. Again the engineers were a little off and although it almost fits my hand, it tends to slide to an unwanted position. It has a short metal stem with a black ball on top.

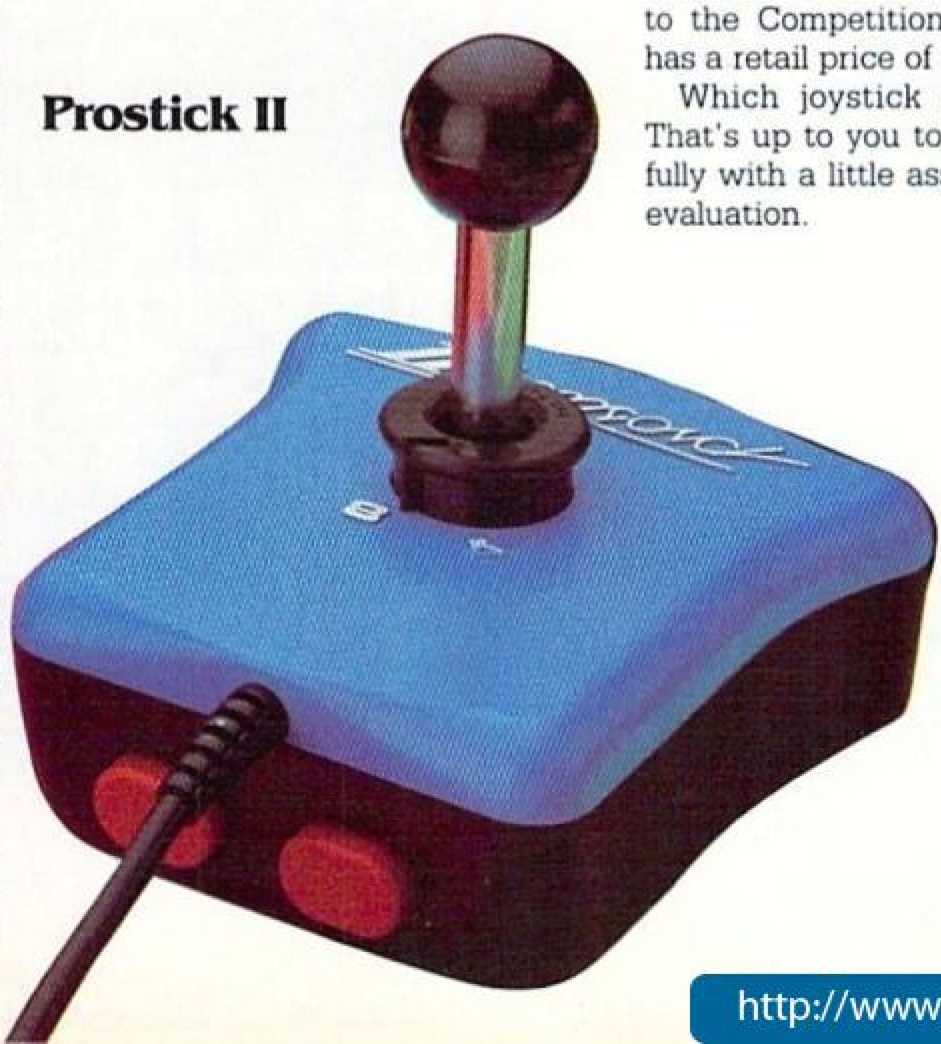
Another interesting feature of this joystick is a switchable four-way/eight-way gateplate which determines the number of directions the stick can be moved. This is a little black collar that fits around the base of the stick. The numbers four and eight are marked on the base and a small arrow is on the collar. This is definitely an advantage in some situations. However, I found that I often forgot to check the gateplate before playing a game, resulting in low scores and frustration until I noticed my error. It is a shame they didn't go one step further and create a four-way diagonal position also. Perhaps then I could finally get through the *Q*bert* games.

On the front side of this joystick (not the top but the front) are two red oval fire buttons. The buttons are raised from the base and have a good feel to them. They are quiet and provide a little more resistance than the other fire buttons, but not enough to make them sluggish. The position forces you to use your index finger rather than your thumb to press the fire button. According to the manufacturer, this results in "quicker response and less fatigue during play." I'll agree with that.

In scoring, this joystick was about average, taking a second place in the maze tests. Personally, however, I would place it a little higher. The overall design and feel is very good. I can use it for hours without getting sore hands. The weight of the joystick and the size and shape of the base and stick all contribute to this.

The overall design and feel is very good. I can use it for hours without getting sore hands. The weight of this joystick and the size and shape of its base all contribute to its good feel.

Prostick II



The Indestructible Joystick?

Now, I think it is time to answer some of the questions I started with.

Although I tested only seven of the joysticks on the market (out of probably 25 to 50 total), I think that I can safely say there is no such thing as a perfect joystick. None of the joysticks were the best at everything. Each joystick had games that it was wonderful with, but each also had games in which it wasn't so good.

Is there such a thing as an indestructible joystick? Well, the Prostick II with its five-year warranty comes close. I can't even imagine using the same joystick for five years. Even a two-year warranty is pretty hefty. I seriously doubt that many people will resist the urge to buy a new joystick for two whole years. Probably a more sensible question would be, "Is there such a thing as a destructible joystick?" The answer to this is a resounding yes! There are joysticks on the market (no names please) that have been known to break within the first week or two of play. Usually either the stick snaps off or something internally stops working. Don't buy a joystick you've never heard anything about unless it at least has a good long warranty.

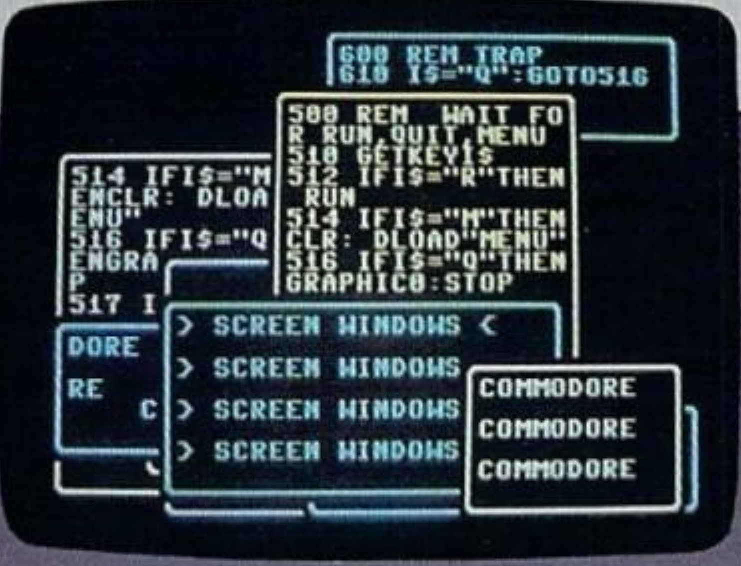
Will a $50 dollar joystick guarantee a higher score? Not at all. The joysticks I looked at ranged in price from $9.95 (Slik Stik) to $29.95 (Trac Ball). The overall highest rating went to the Competition Pro 1000 which has a retail price of $12.95.

Which joystick is best for you? That's up to you to figure out, hopefully with a little assistance from this evaluation. **C**

NEW KID ON THE BLOCK:

THE COMMODORE 16

commodore 16



```
600 REM TRAP
610 I$="Q":GOTO516
```

```
500 REM  WAIT FO
R RUN,QUIT,MENU
510 GETKEYI$
512 IFI$="R"THEN
 RUN
514 IFI$="M"THEN
CLR: DLOAD"MENU"
516 IFI$="Q"THEN
GRAPHIC0:STOP
```

```
514 IFI$="M
ENCLR: DLOA
ENU"
516 IFI$="Q
ENGRA
P
517 I
```

```
> SCREEN WINDOWS <
> SCREEN WINDOWS
> SCREEN WINDOWS
> SCREEN WINDOWS
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COMMODORE
COMMODORE
COMMODORE
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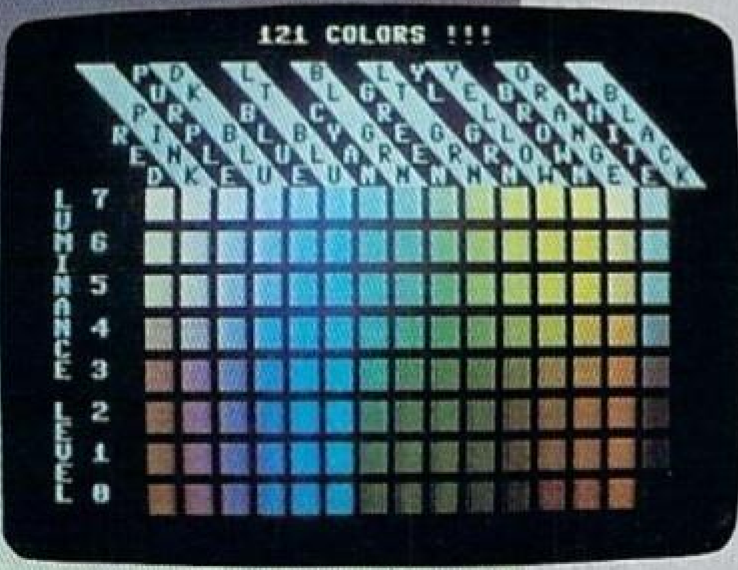
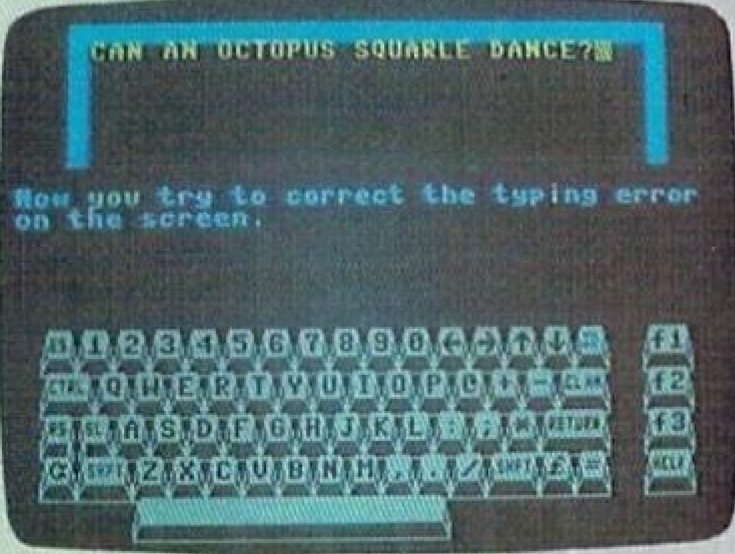
While the computer world talks about Commodore's new Plus/4, the Commodore 16 sits quietly waiting for the attention it deserves.





CAN AN OCTOPUS SQUARLE DANCE?

Now you try to correct the typing error on the screen.

POWER
f 1
f 4
f 2
f 5
f 3
f 6
HELP
f 7

CHARLES BARTHOLOMEW

The Commodore 16 is a 16K computer (12277 bytes free) with BASIC 3.5 and a built-in monitor (TEDMON). BASIC 3.5 contains over 110 commands, statements and functions and TEDMON contains an additional 16 commands. Although this is a new line of computers, Commodore has kept it compatible with all of the major Commodore 64 peripherals (monitors, disk drives and printers).

At first glance, the Commodore 16 looks like a Commodore 64 with a charcoal grey case. However, a closer look reveals the differences in the keyboard. Some of the changes include cursor left, right, up and down (yes, individual keys) where the "+", "−", English pound and CLR/HOME keys were located on the 64. The CLR/HOME key has moved to where the RESTORE key used to be, and there's an ESC key where the back arrow was. The function keys have been renumbered and what used to be F7 is now a HELP key. But although some keys have moved around, all of the CHR$( ) codes have remained the same. So, although the up arrow key is now a shifted 0, it is still a CHR$(94).

A nice change in the hardware itself is the addition of a reset switch next to the power switch. Now you can escape a crashed computer without turning it off. As with a Commodore 64 warm start (SYS64738), only the pointers and the first ten bytes of BASIC are actually reset.

BY JIM GRACELY

Technical Editor

BASIC 3.5

The Commodore 16 has a new version of BASIC built in. This is an upgrade of the BASIC that was in the VIC 20 and the 64. In fact, it is even an upgrade from the BASIC in Commodore's PET/CBM computers. What makes this version so powerful are the graphic commands, the disk handling commands and the special programming utilities.

GRAPHIC COMMANDS

The graphic commands built into the Commodore 16 allow you to draw high-resolution screens, create geometrical designs, or fill the screen with a rainbow of colors. Some of the new graphic commands are:

GRAPHIC: Using this command you can choose normal text screen, high-resolution screen, split screen with text and high-resolution, multicolor high-resolution, or split screen with multicolor and text.

CIRCLE: This command allows you to draw all or any portion of any polygon anywhere on the screen, using any color, X radius, Y radius, rotation and angle between sides. The command has nine parameters to allow you to draw anything from an arc of a circle to a decagon.

BOX: Using the box command, you can draw a rectangle of any size anywhere on the screen. The rectangle can be rotated through any angle and can either be an outline only or a filled in shape.

PAINT: This command allows you to fill any closed area on the screen with any color.

DRAW: With this command, you can draw a dot, a line between any two points on the screen or a shape (you can use multiple sets of points in the same command).

DISK HANDLING COMMANDS

Anyone who is familiar with the Commodore PET/CBM computers will appreciate the power of the disk handling commands that are built into BASIC 3.5. These commands include:

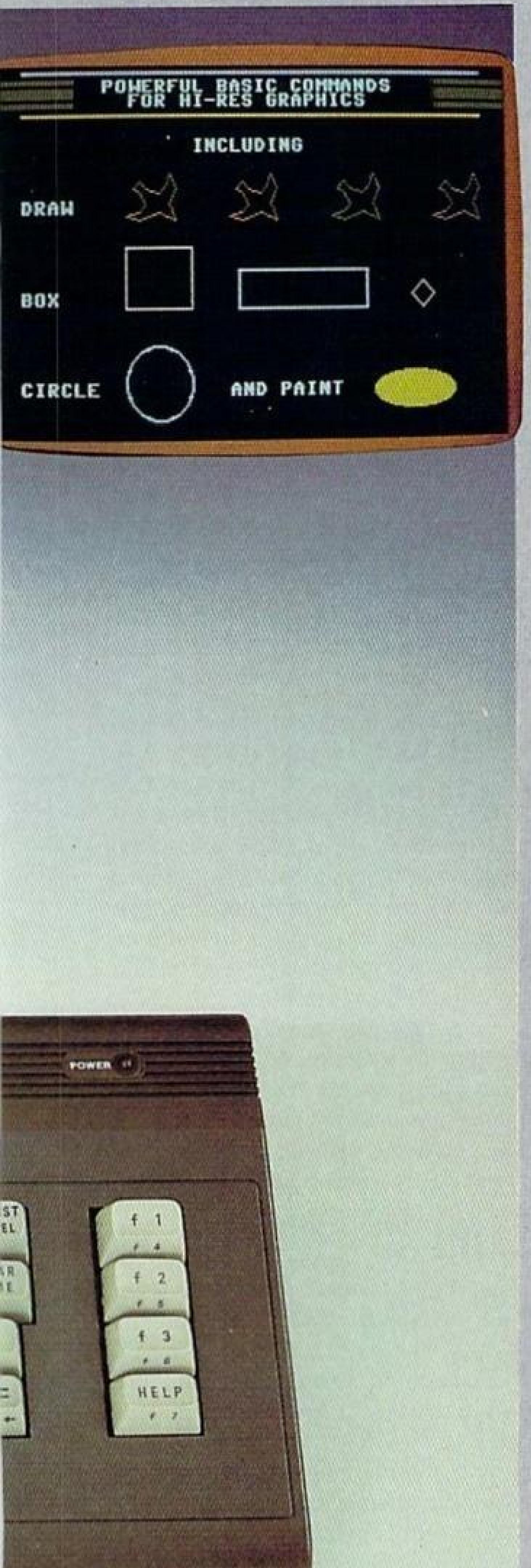
DIRECTORY: This command lets you view the disk directory without loading it into the computer. You can view either all the files or use combinations of wildcards (*) and don't cares (?) to choose only selected files to view. The F3 function key is programmed with this command when you turn on the computer.

DSAVE: This is a disk save command. To save a file called TEST on your 1541, you just type DSAVE"TEST". Function key F5 will print this command on the screen.

DLOAD: This is a disk load command. To load a BASIC program called TEST on a disk into your computer, you just type DLOAD"TEST". Function key F2 will print this command on the screen for you.

DISK FORMATTING COMMANDS: There are separate direct commands for formatting a new disk (HEADER), scratching a file (SCRATCH), validating a disk (COLLECT), renaming a file (RENAME), copying files (COPY) and backing up a disk (BACKUP).

commodore 16



PROGRAMMING AIDS

The Commodore 16 has a number of commands to help you enter programs, debug programs and polish up programs. Some of these commands are:

AUTO: The Auto command will automatically put line numbers on the screen for you as you are entering a program. The lines can be numbered by ones, tens or hundreds.

DELETE: This command will allow you to delete any range of lines in your program. You can delete a range of lines, up to a line, a single line or everything following a line.

HELP: If you run a program and get a syntax error or a division by zero error, you now have some help. This command (also one of the function keys) will list the line with the error and flash whatever portion it thinks contains the error.

SOME PEEKs AND POKEs

For those of you who may have already purchased the Commodore 16, here are some of the more important memory locations along with a couple of extras.

BASIC text starts at 4096 decimal and ends at 16374.

The screen starts at 3072, uses 1000 locations and ends at 4071. By the way, you don't have to poke a color in order to get a character to show up on the screen. If you want an A in the top left corner, just type POKE3072,1.

The color map starts at 2048 and is also 1000 locations ending at 3047. The colors to be poked are numbered from one to 16 (add one to all VIC 20 and 64 color numbers). Color can be modified by changing the luminance or making the location a flasher.

To change the luminance of a color location, multiply the luminance level by 16 and add it to the color number. Remember that the lower the luminance level, the darker the color. To poke a dark red (#3) to the upper left corner, multiply the luminance level 2 (dark) by 16 (7*16=112) and add the color number 3 (POKE 2048,115).

If you want the color location to be a flasher (any character poked there will flash), add 128 to the poke value. In the example above, you would add 128 to the 115 and POKE 2048,243.

The direct poke locations for the screen and background colors are locations 65301 and 65305 respectively. The values when you power up are 241 and 238.

The pointers for BASIC text are the same as the VIC 20 and the 64. They are:

43,44: Beginning of BASIC
45,46: End of BASIC, beginning of variables
47,48: End of variables, beginning of arrays
49,50: End of arrays
55,56: End of BASIC memory

To disable the RUN/STOP key, poke location 806 with 103. Poke 806 with 101 to reenable the RUN/STOP key.

To make the computer crash in a different sort of way (always popular in Canada), try poking 788 with a 115 or a 127.

Here is one last tidbit. This short program will display the familiar color blocks on your TV or monitor so that you can adjust the color. Each of the 16 colors are displayed (some of the colors are different from those on the 64) and each color is displayed with six of its eight levels of luminance. Once the blocks have been drawn, pressing the space bar will change the background screen color. The background will roll through the 16 possible colors and six luminance levels. If you thought picking a combination of background, border and character colors was hard on the 64, you have 1,771,561 possibilities with the Commodore 16. —*Jim Gracely*

C

SOFTWARE FOR THE COMMODORE 16 FROM COMMODORE

This software is already available or will be available shortly from your Commodore dealer.

ON CARTRIDGE

GAMES:
- Atomic Mission
- Pirate Adventure
- Jack Attack
- Strange Odyssey
- Viduzzles

EDUCATION:
- Pilot II

PRODUCTIVITY:
- Script +
- Calc Plus

ON TAPE

EDUCATION:
- Match/Count
- Math Games
- Maze Mania
- What's Next
- Super Spell
- Letter Sequences
- Shapes & Patterns/Group It
- Letter Match/More or Less
- Typing Professor
- MindBender

PRODUCTIVITY:
- Money Decisions/Investments
- Money Decisions/Loans

OTHER:
- Software Starter Kit
- Experiences in Software

TRON and TROFF: These two commands turn on and off the trace function on the Commodore 16. If you have trace turned on (TRON) when you run a program, as each line is executed the line number is printed on the screen.

RENUMBER: This command will renumber the lines of your program, starting at any line with any line increment. This command *will* recalculate any GOSUB or GOTO commands that are in your program.

In addition to these programming aids, there are also some new programming commands to use within your programs which give BASIC some of the power of PASCAL and FORTRAN. These include an IF..THEN..ELSE command, a DO/LOOP/WHILE/UNTIL/EXIT command, a PRINT USING command with accompanying definition command (PUDEF) and the combination of TRAP and RESUME commands for trapping errors within a program.

There are also a couple of new functions included in BASIC 3.5. They include a JOY function for reading the joystick ports, DEC and HEX$ functions for converting from hex to decimal and vice versa, and an INSTR function to locate the position of one string within another.

In all, BASIC 3.5 is the most powerful implementation of BASIC I have ever seen in any microcomputer.

THE MONITOR

The monitor that is built into the Commodore 16 is a very nice, easy to use monitor. The commands that are available are all the usuals: a memory dump (M); a load (L) and save (S) command; register display (R); and exit (X). In addition, there are commands for assembling (A) and disassembling (D) code, comparing (C), transferring (T) and filling (F) memory. Not a bad little monitor to work with, especially since it is always in memory and not lost on some disk somewhere. I find that I use it quite a bit.

ADD IT ALL UP

There are many other features to the Commodore 16 that you won't find in any other computer on the market in the same price range. These include windowing capabilities, eight levels of luminance for each of the 16 colors, directly programmable function keys, flashing characters, two-tone generators with direct sound commands and full screen editing.

When you look at all of the features that the Commodore 16 offers, it is easy to see why Commodore is referring to it as the "World's Learning Machine." **C**

BY JOHN O'BRIEN

SOME LIKE IT HOT

KEEP YOUR COOL AS YOU FIGHT SATAN AND HIS DEVILISH HORDES.

Satan's Hollow is Commodore's latest adaptation of a Bally/Midway arcade classic. Apparently, it's so close to the original arcade version, that a review for anyone who has played it at the arcade would be easy—it's as good as the original! I'm told it may be the best adaptation ever. So this review is for people like me, who have never played it at the arcade.

In a nutshell, the idea of the game is to fight off Satan's swarming squad (say that three times fast) while building a bridge to reach him. The attackers come in a devilish variety of forms and attack patterns and have lots of nasty tricks up their sleeves to keep you from getting to Satan. Besides suicidal attacks at your missile launcher, the demons attack you with lava eggs, molton rocks and your basic fire breath. Satan's horde also makes your life difficult by destroying your bridge and stealing your extra missile launchers.

You're not helpless against the nasties though. Your missile launcher can, of course, fire missiles, but only one at a time. You can earn better firing capabilities in later rounds. You also have a shield that protects you and destroys anything that comes in contact with it. But watch out, it only lasts one second. It will, however, energize to full power when you're not using it. The level of strength is displayed at the bottom of the screen. Use it carefully.

There are two ways to play—the normal and easy. Starting off on the normal mode is a real "baptism by fire." I tried this way first and was not making much progress. In fact, I couldn't crack the top ten scores that were on the disk when I got it (technical editor Jim Gracely had it first). So I switched to the easy mode and showed immediate progress. I finally cracked the top ten! However, when I saw my initials on the list, I noticed that when you use the easy mode, a big "E" is placed next to your name. So much for my moment of glory.

The music and graphics are arcade quality and feature some really nice touches. It turns from day to night and back again as you go along—if you survive long enough. At night, however, you can only see the attackers by their glowing eyes. The music is classy too. Or should I say classical, because it's Wagner's "Ride of the Valkyrie."

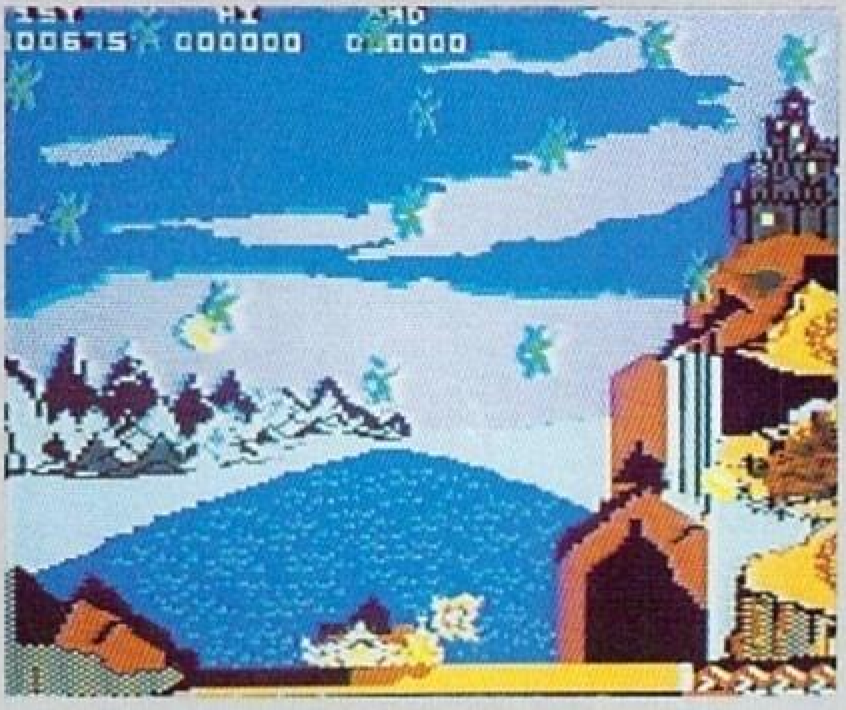
The fire-breathing devils' heads that attack are excellent. The first one that attacks is Lucifer. You can pick up some points by shooting him down, but if you miss him and he misses you, then a larger Old Nick attacks. If you miss him also, an even larger Beelzebub gets the last shot. If you both stay alive through all three attacks, then the next wave of attackers start.

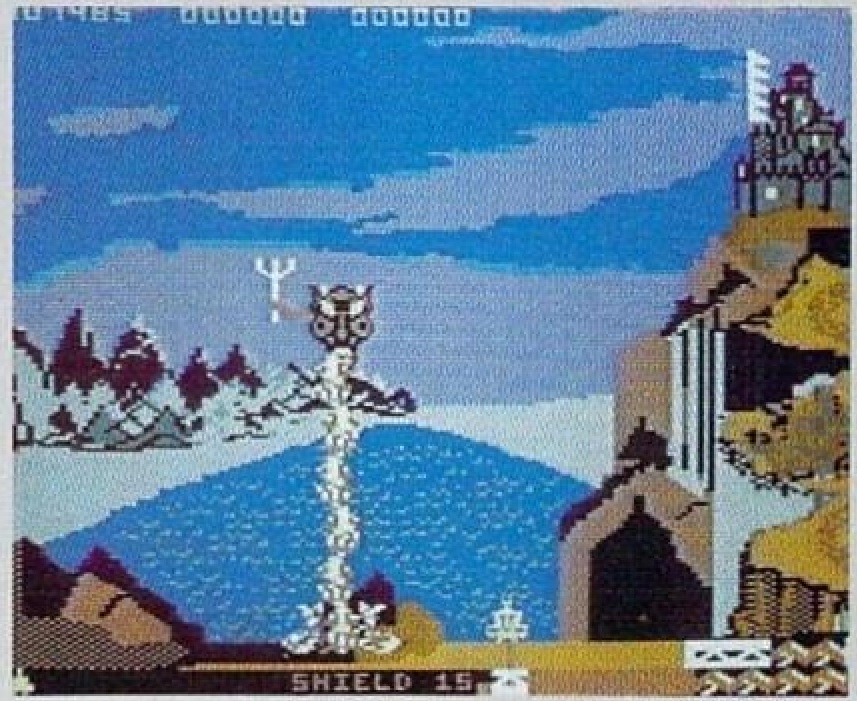
Satan himself will throw you off a bit. He's the least scary-looking of the whole bunch. But don't underestimate him! He's quick, unpredictable and hurls deadly tridents that destroy your launcher on contact. The hollow (the place where you run into Satan) becomes even more dangerous in later rounds as fire-sparks destroy you. This is the part of the game where you can pick up bonus points.

The instructions that come with it are more in-depth than most action games. The instructions give lots of hints that really come in handy and fully describe all the characters and their various characteristics. It even gives names and diagrams of all the attack patterns of each attacker. Don't get the idea that it reveals too much and detracts from the challenge—you're going to need all the help you can get.

The play action is fast and furious. Your reflexes must be up to snuff and you must be able to make quick tactical decisions. This is a game that will both challenge and frustrate you. But if it does get too intense, there is a pause feature.

If you need a further challenge, consider this: one of Commodore's programming assistants, Matt Blais, has reportedly recorded an incredible score of 2,600,000 points in the game during the course of testing. Try if you will, but I think it will be a cold day in you know where before that record gets beaten!

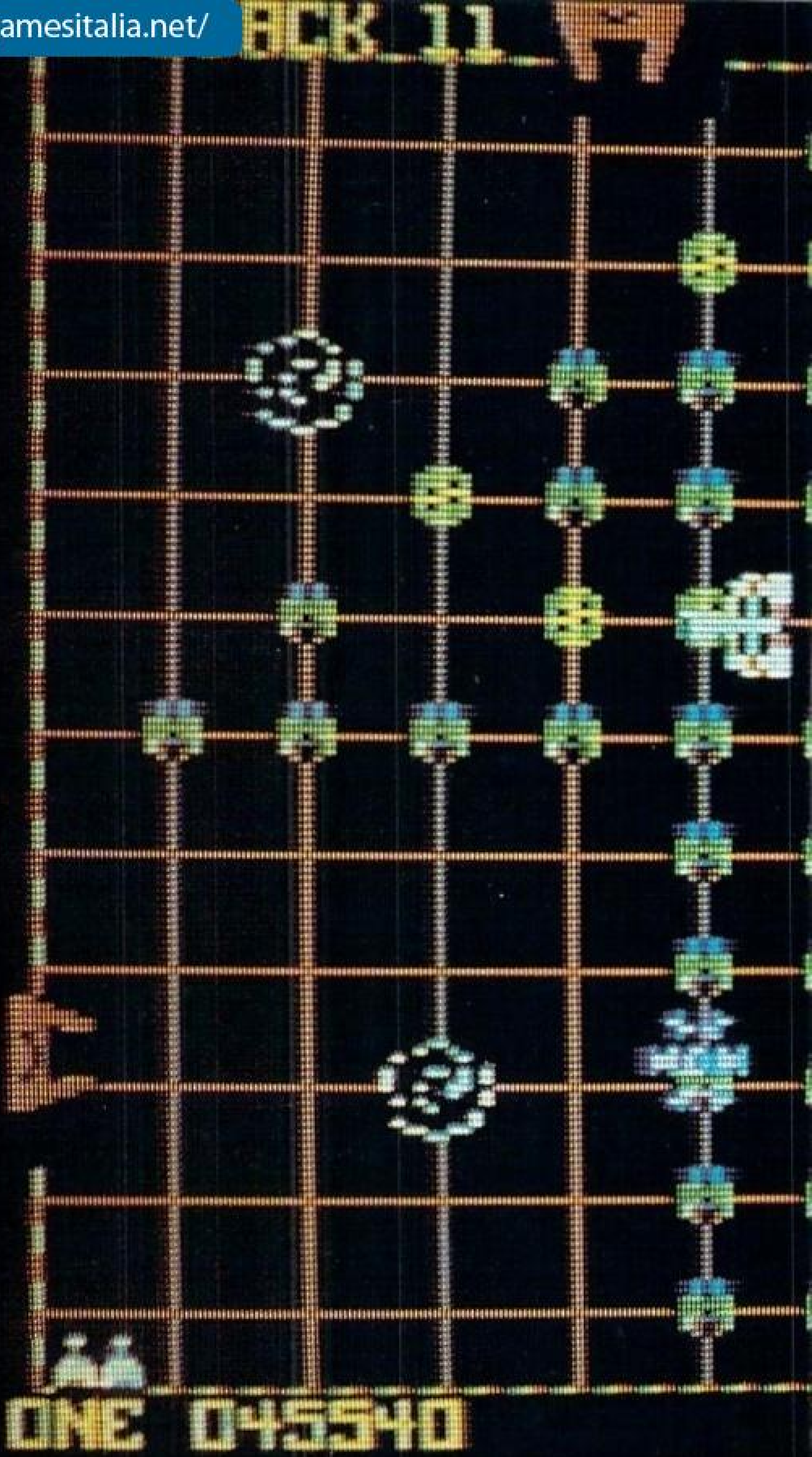


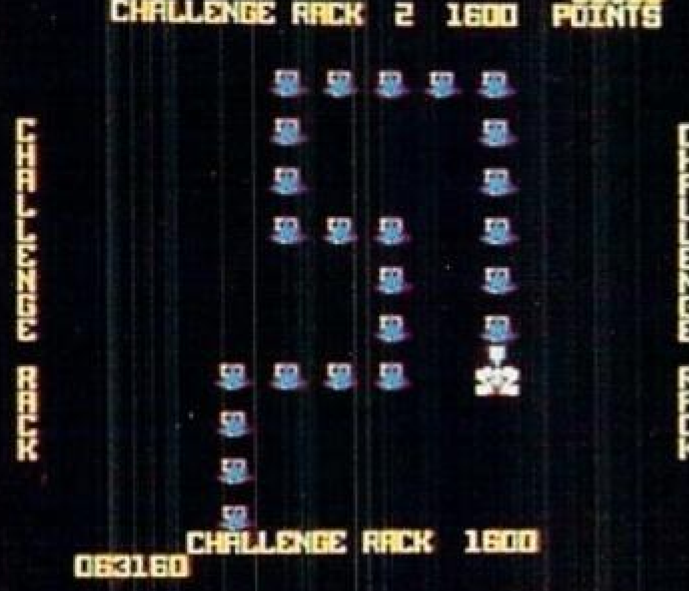


TAKE THE SOLAR FOX CHALLENGE

COMMODORE'S RECENTLY RELEASED *SOLAR FOX* FOR THE 64 BLENDS ELEMENTS OF GRID, TARGET AND EVASION GAMES INTO A FAST-PACED CHALLENGE.

BY WALT LOUNSBERY





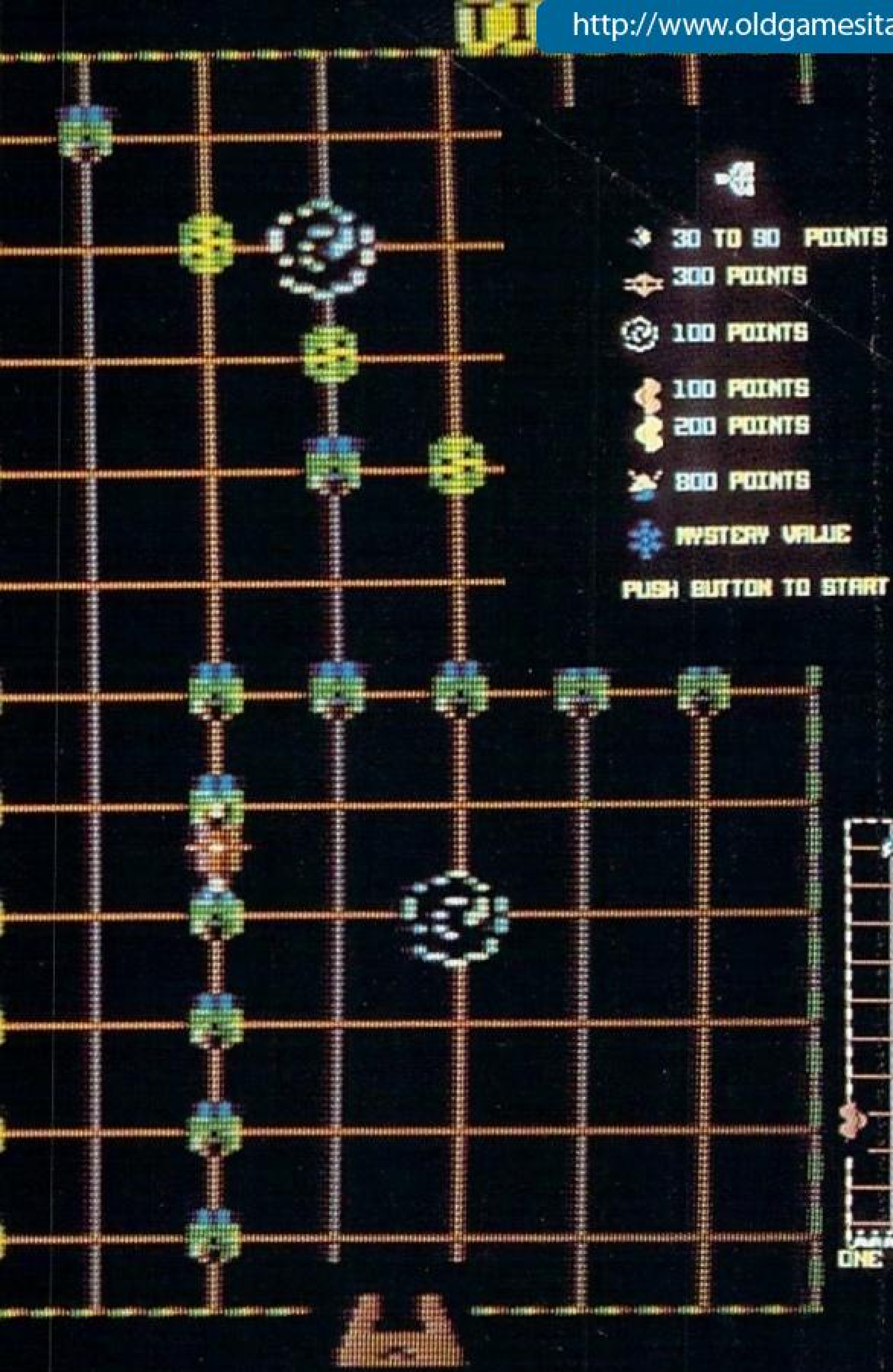
Every now and then, something comes along that is deceptively simple, yet far more clever than first impressions reveal. Almost all of the lasting classic games have this quality. I don't want to recite my entire personal list of classic video candidates here, but Commodore has recently released a Bally/Midway arcade game, *Solar Fox*, that is worth watching. In fact, don't just watch it, try it and add it to your collection.

Commodore's version of *Solar Fox* rivals the arcade game in quality of play, sound and graphics. *Solar Fox* contains the elements of grid games, target games and evasion games, all blended into challenging, fast-paced play action.

Exactly how does the game work? Basically, your mission is to clear the screen of a pattern of small objects at grid intersections. These objects are called fuzors and eliminating one can give you 30 to 90 points, depending on the difficulty of the pattern and the level of the game.

There are two methods at your disposal for clearing the grid. One method is simply to direct your spaceship with the joystick and run over the little fuzors (you can start the game with three or seven spaceships). You can also use a short-range laser in the nose of the spaceship to zap two fuzors at a time. The laser is really quite important, because even with its short range, it is the only way to get rid of some unpleasant obstacles. Used correctly, it can greatly reduce the time and risk of clearing the grid. In other words, use it or lose it.

In *Solar Fox*, it is important to do things quickly, because bonus points are awarded for speed. Each fuzor pattern is called a rack and in the upper right corner of the screen is the Skip-a-rack Timer. The letters spelling out Skip-a-rack Timer literally count down the remaining time by disappearing one at a time. If the rack is cleared before the timer evaporates, then the next rack is automatically cleared as well, giving you all the points of that rack. You also earn a 500-point bonus, with an extra 100 points for each block left on the yellow Skip-a-rack Timer line. This is really the only way to get really high scores and extremely difficult to do. To beat the timer, it is necessary to clear the rack at the high speed setting (there is a low and a high speed available).

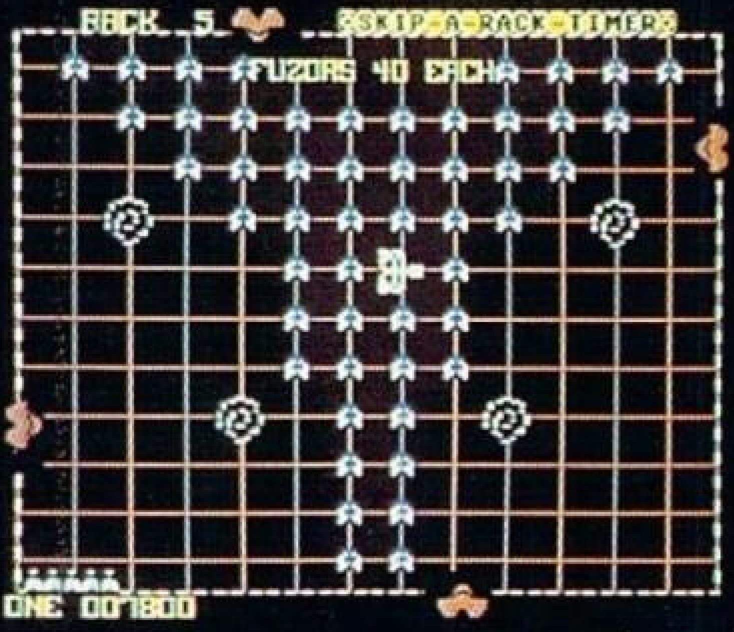


It seems that the advent of computers gave game designers the opportunity to make games that fight back. *Solar Fox* falls into this category, since there are many obstacles and complications that slow your effort to clear the rack. At early levels of play, these things hardly bother you, but as each rack is tackled, they really become a major headache.

The worst items are the thrustors that move back and forth along the borders of the grid. These are normally colored red and they are indestructible. Run into one and your spaceship is destroyed. No matter what their color, they try to destroy your spaceship by firing vortexes across the grid. As the game progresses, the vortexes can travel further across the grid, move faster and appear more frequently. If your spaceship is set at high speed, then you can outrun them in a pinch. It is possible to shoot them, but this wastes time. It is possible to stall the thrustors. If you shoot a red thrustor, all four will stop moving for a short time. They still shoot fuzors, though. If a thrustor happens to turn yellow, then you can shoot it or run into it and it will be completely disabled for a while and the rest will stop moving. All of this sounds complicated, but it is possible to take advantage of all these rules to stop the thrustors and clear difficult parts of the rack in time.

At this point, I have to admit that you can really play this game with either of two strategies: The game is mainly oriented towards clearing the rack in a short time and getting lots of bonus points for speed. To do that, you have to trust your reflexes, play the game at high speed and avoid a lot of obstacles that could earn you points if you wasted the time to shoot the little buggers. I like to play the game this way.

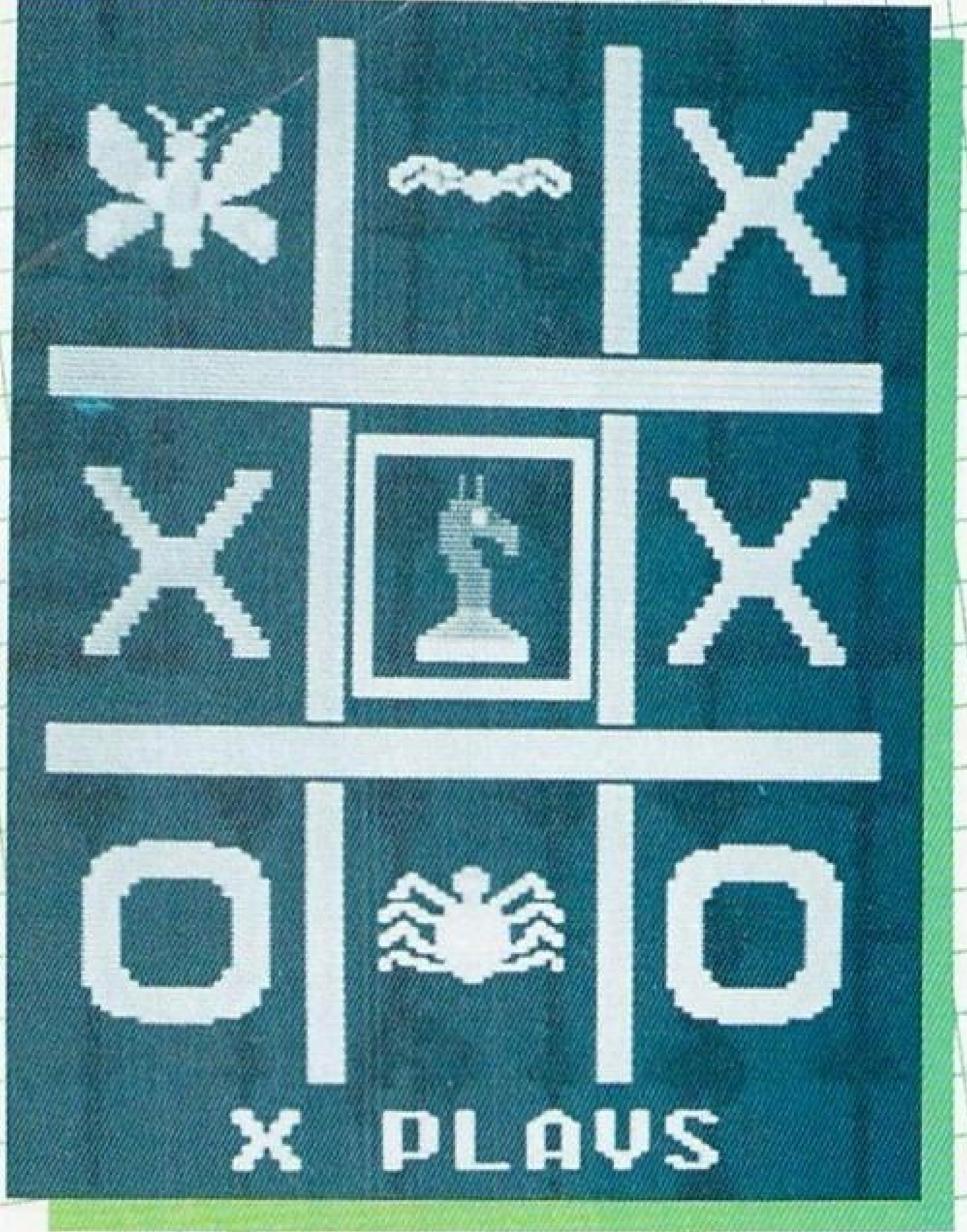
However, my wife, who happens to have tripled my top score, likes another strategy. She prefers to play at low speed, ignoring the Skip-a-rack Timer (not to mention the instructions for the game). She amasses great gobs of points by taking her time and shooting everything in sight, especially the high-point objects. She has a lot of fun with *Solar Fox*, which really says a lot for the game, since she usually ignores the games and programs on my Commodore 64. In fact, she gave up on her last session with *Solar Fox* with the words, "My thumb is killing me!" Somehow I don't think that will keep her from trying it again.



If you play this game slow, you have to understand that a challenge rack appears every four regular racks. This challenge rack pattern can only be cleared at high speed, without any wasted motion. These things are worth 1,000 points for the first pattern, with up to 16 new challenge racks presented until you make a mistake (the second challenge rack is worth 600 points more than the first, the third is worth 600 points more and so on). It is hard to give up this opportunity, although you can play the regular racks at low speed and toggle to high speed in the challenge racks with the Commodore logo key. In my opinion, changing the speed confuses

Continued on pg. 128

TRIAD AND TRUE



TRIAD IS A NEW COMMODORE 64 STRATEGY/ACTION GAME FROM COMMODORE THAT COMBINES THE THEORY OF TIC-TAC-TOE WITH THE CLASSIC ELEMENTS OF A VIDEO SHOOT-'EM-UP. IT OFFERS MANY NEW STRATEGIC TWISTS BASED ON NINE UNIQUE, IMPROBABLE ENEMIES WHO MUST BE DEFEATED TO EARN EACH SQUARE OF THE TIC-TAC-TOE GRID.

BY STEVE FINKEL

In the tic-tac-toe arena, if one has achieved even an elementary level of awareness, one can play a tie game against any opponent. For either X or O to triumph over its opponent takes a truly bad effort on the opposing side. The real nature of the basic tic-tac-toe game is to perpetuate futility. Commodore's new *Triad* for the 64, however, with its video twist, adds a new dimension to the age-old X/O struggle.

Both skill and strategy are required to play *Triad*. Part of the strategy is centered around the tic-tac-toe grid. You must know in which square to place your letter, relative to your opponent (who may be the computer). The real challenge in *Triad*, however, is combining your tic-tac-toe strategy with active arcade skill to defeat the enemies who inhabit each square. You must win the battle with each enemy before you can place your X or O in that square. If your background includes some tic-tac-toe training, you are probably aware of which moves are to your benefit, as your opponent undoubtedly is. The strategy that makes or breaks your game revolves around how you combat the square-dwellers.

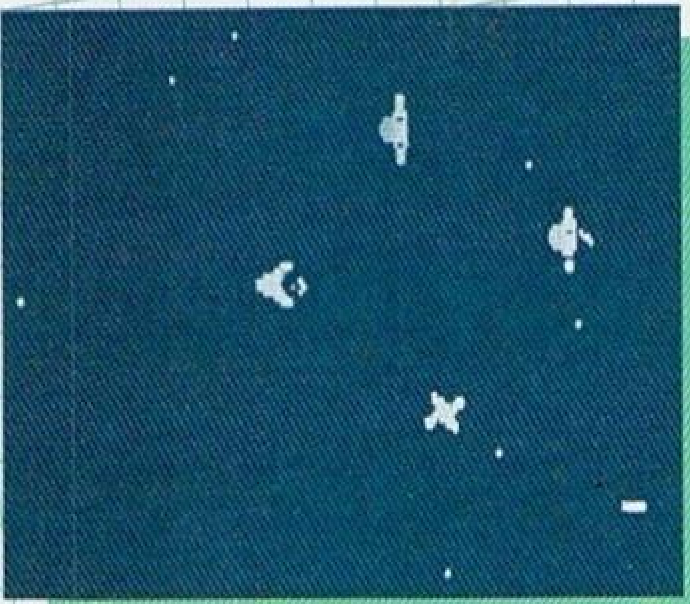
The nine different forms of enemies pose different threats to your missile launcher and must be attacked in different ways. Since the squares' contents are shuffled after each game, you must be able to defeat each different enemy. Your choice of opposition to earn a single square will be from among chess pieces, killer bees, saucers, bats, arrows, death masks, spiders, faces and moths. Let us examine each of these real-life nemeses and also consider the nature of these beasts in *Triad* and the strategy necessary to defeat each foe.

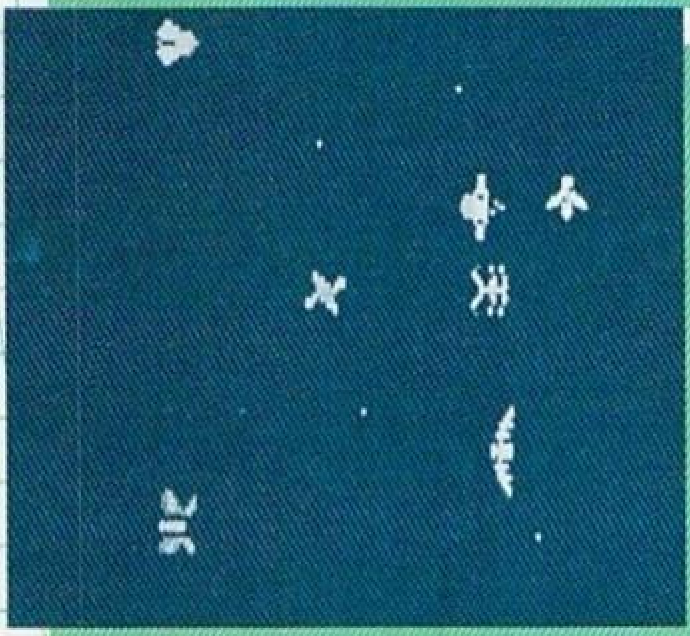
Chess Pieces: In real life, you must outplay your opponent at chess to triumph over chess pieces. Or, failing that, you can throw a tantrum and knock the board over, causing the hapless chess pieces to scatter. In *Triad*, if you want the square inhabited by the chess pieces, you begin by facing a single piece—a pawn. Shoot the pawn and it splits into two knights. Each knight splits into two rooks when hit with your missile; each rook splits into two queens. Once a piece is a queen, it can be destroyed.

The best strategy for victory among the chessmen is to keep the pieces from moving diagonally. If they move on a diagonal path, their trajectories can be all over the screen, leaving your missile launcher in a very precarious position. A single collision and you lose. To keep the pieces going on a horizontal and vertical path, you must shoot them at an angle. If you are able to shoot pieces at a 45-degree angle, you can hold your position while the pieces split because they will maintain a predictable path. Failing that, you can always knock your computer to the floor and scatter the chess pieces, but this is not recommended.

Killer Bees: The threat posed by killer bees to mankind is debatable. Some really awful horror movies have portrayed the terror posed by these souped-up insects, but they seem to lack any real kind of attack plan. Instead of mounting an organized charge on a major population center, they seem to spend more time bothering Central American entymologists. As far as I'm concerned, exposing the killer bees to lots of Central American entymologists is the best method we could possibly come up with to use against them.

In *Triad*, however, there are no entymologists of any kind, so a different strategy must be employed if you want this square. The killer bees move across





the screen from left to right, flying at a slight angle up or down. The bees can be destroyed only by hitting them with a missile shot head-on or from behind (not from above or below or at an angle). The bees speed up as you progress, so this becomes increasingly difficult.

Saucers: Alternately known as UFO's, spaceships and a host of other names, there have been no real-life confrontations with these objects. There have been a lot of different ways to challenge these crafts in science fiction movies, some more successful than others. If they ever really attacked, giving up might not be a bad idea, although selling them to Disneyland might be more profitable. The *Triad* versions can be had by shooting into their exhausts from below. Care must be taken, since the saucers constantly drop missiles down.

Bats: Old wives' tales accuse bats of sucking blood and suggest that garlic and silver crosses be used to ward them off. Personally, I use garlic and silver crosses to ward off old wives. If there are bats around, I tend to go elsewhere. While you could do that in *Triad,* you may be forced to go against the bats if you want a certain square on the grid. Bats appear on the screen alone, but when you hit them with missiles initially, floating land mines appear. When a certain number of land mines have been created, you can destroy the bats with your missiles. But don't let a land mine hit you or the square is lost.

Arrows: Usually, fighting with arrows isn't too tough. You can snap them in half with your bare hands. If someone is shooting them at you, it's a slightly different story. If a suit of armor isn't handy, you might want to take into account various insurance plans. The level of danger depends mainly on the accuracy of the shooter.

In *Triad,* accuracy is not the issue; your own timing is what defeats the arrows. The arrows move from left to right across the screen, gravitating up or down toward the level of your ship. Your missiles cannot hurt them as they move in this direction. You must hit them at the left edge of the screen to make them reverse direction so that you can destroy them. The timing of your missile shots at the edge of the screen is crucial to your success against the arrows.

Death Masks: You may well ask what exactly is a death mask. Good question. It is a face covering used for burial or ceremonies in other cultures. How do you protect yourself from these masks? Your best bet is to avoid these cultures like the plague. If you get an invitation to go to a costume party from one of these cultures, say you're sick. It's not the mask itself that presents a threat, it's the implication.

That is not the case in *Triad.* Collision with a mask is deadly. In addition, there are diamonds that float around the screen along with these masks. You can only destroy the masks after shooting a diamond. The black eyes in the mask turn to white when your missile hits a diamond. Only when you see the whites of their eyes will your missiles have any effect on them. Watch out even after you get one, because it will rise to disappear off the top of the screen.

Spiders: Many people are deathly afraid of spiders. They'll do whatever it takes to get rid of spiders and their webs: step on them with their shoes, call an exterminator, send them on all-expense-paid trips to the Bahamas. *Triad* spiders can be exterminated only by a missile that is shot from the direction in which they are headed. That is, if a spider is moving diagonally toward the right corner of the screen, only a missile shot diagonally from the right corner can eliminate it.

Faces: These are the same faces that were so popular a few years ago on "Have a Nice Day" stickers. I still don't like them. Back then, I used to deface them by drawing tongues, teeth and moustaches. But I knew they wouldn't go away until the general public got tired of the whole "Have a Nice Day" concept. I get immense pleasure from destroying them even now.

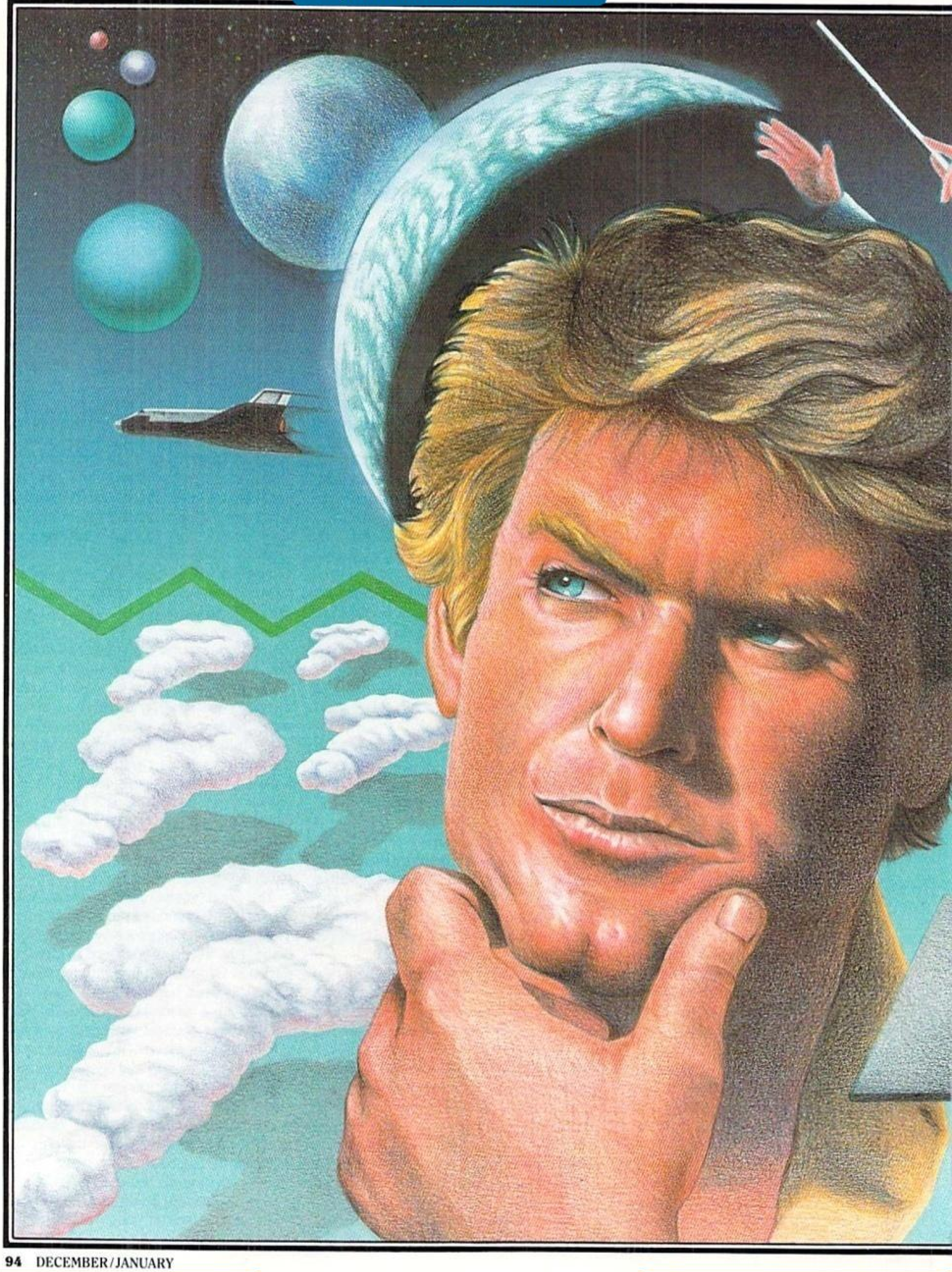
In *Triad,* these faces do act differently, however. Often the first shot splits a smiling face into two slightly less happy faces and those split into two unemotional faces, then unhappy (even miserable) faces. The best way to face this challenge is to fire both shots almost simultaneously. The first shot stuns a face and causes it to begin to split. An immediate second shot destroys it. If you're not quick enough, the face splits and you have trouble.

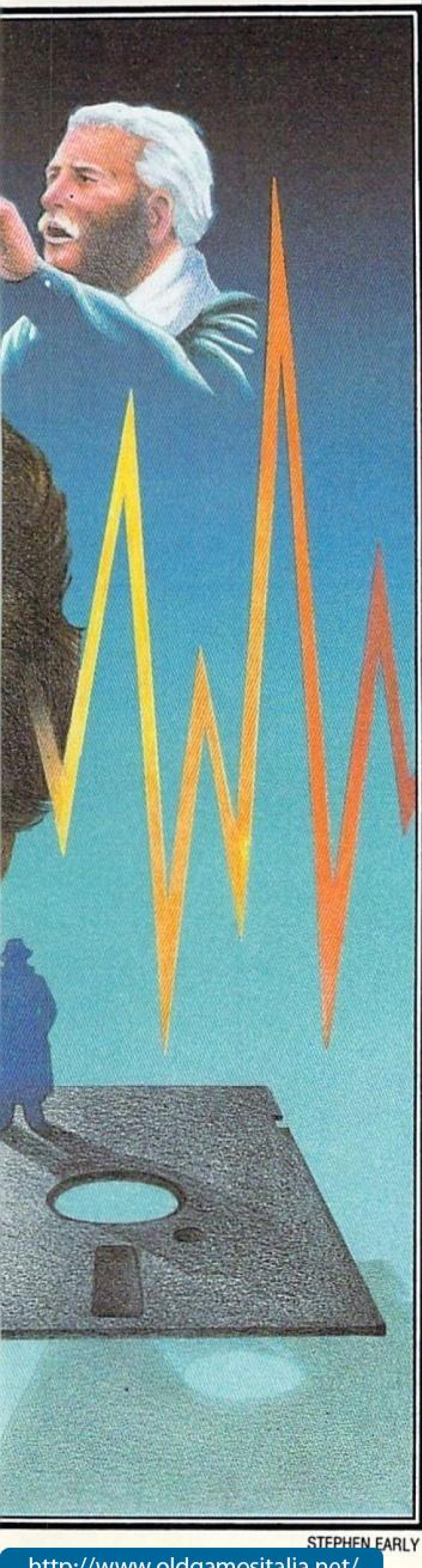
Moths: The standard treatment for moths is mothballs. Have you ever wondered exactly *what* those things are made of? And exactly what do they do to moths to get rid of them? I've bought them several times to use against moths, but with very little success. Those things are just too small to throw accurately! Against *Triad* moths, you have to first hit each moth with a missile to get them all moving sideways. Only when every single moth is moving sideways can you destroy any.

In addition to the strategies you use to conquer your foes, in each square, there are higher level tactics you can employ involving the rotating mines that crisscross the screen in higher levels. When these mines explode, anything nearby the explosion gets decimated. Against an enemy that multiplies, like the chess pieces or the faces, this is a lifesaver. If you hit a single pawn *and* one of these mines with a single missile, the pawn does not split, multiply or waver. It simply disintegrates. Checkmate.

The land mines skitter across the screen in later rounds from all directions. They are most dangerous when moving diagonally. You can get them to change direction by hitting them with a missile. They are least harmful when they are moving in a predictable direction like horizontal or vertical. When they start dominating the screen, it is a good idea to just shoot the diagonal ones until their movement is less dangerous to your ship. Mastery of tactics and strategy involving land mines adds yet another level of strategy to the tic-tac-toe grid.

So there you have it, tic-tac-toe elevated to a new strategic/joystick strata. In the tic-tac-toe tradition, *Triad* adds some more unique things to do with your X's and O's. **C**





STEPHEN EARLY

Life After Games

BY CAROL MINTON, ASSISTANT EDITOR

The choices are limitless; the quality superb. No longer do arcade games always get the top billing.

If you're looking for an alternative to run-of-the-mill games, take a good hard look at this innovative software and hardware. And remember, they are only the chip, I mean tip, of the iceberg.

Brain Teasers

HesWare (150 N. Hill Drive, Suite 35, Brisbane, CA 94005) has released *M-SS-NG L-NK-S* for the Commodore 64, a unique fill-in-the blanks puzzle where word patterns and context clues are given in order to complete literature passages. One subject is chosen from nine and a passage is picked from there. The blanks then must be filled until the passage is complete.

The difficulty levels run the gamut from easy (only vowels missing) to brain-crushing (mostly blanks). The length of each side's turn and the speed at which the program fills in missing letters can be set. These can be saved for next time.

How about some trivia? Professional Software (51 Fremont Street, Needham, MA 02194) has introduced *Trivia Fever*, formerly *Trivia Mania*, for the 64 in the latest effort to keep up with the nation's trivia enthusiasm. This entertainment program consists of thousands of trivia questions not only on diskette but in book form too, so it can be played with or without a computer.

The object of the game is to answer trivia questions of varying difficulty levels to fulfill requirements in user-selected question categories. After each category is completed, a game-winning question must be answered.

Trivia Fever can be played with up to eight players or eight teams. A Master of the Game is chosen to control the computer's activities and an expert player may be handicapped by allowing the computer to pick the categories instead of the player. Categories include science and technology, geography, history, sports, films and entertainment, famous people, and nature and animals.

Along the lines of trivia, try Sight & Sound's (3200 South 166th Street, New Berlin, WI 53151) *Tune Trivia* for the 64. Play the trivia challenge but with music tunes!

Other trivia games include *Trivia Plus* by Academy Software, *Fact-actics* by Daystar and *Trivia Arcade* by Intelligent Statements.

Self-Help

Batteries Included (3303 Harbor Boulevard, Suite C9, Costa Mesa, CA 92626) offers a program for the 64 to assess thought patterns and physiological impulses in an attempt to gain an understanding of the factors contributing to stress. *The Stress Manager* interprets data sent from the Galvanic Skin Resistance module (placed on the fingertips). The results are then displayed in graph form. Graphic analysis and related data can be saved for future reference.

Another product along these lines for the 64 is *Relax* by Synapse (5221 Central Avenue, Richmond, CA 94804). This program allows you to measure the tension in your muscles. By becoming aware of this tension through immediate and continuous feedback, you learn to decrease your tension level. *Relax* consists of four basic parts: audio cassette tape, sensor headband, electromyograph (interprets signals received by sensor) and the software. The goal of the program is to teach you how to enter a state of deep relaxation.

> ***The goal of Relax is to teach you how to enter a state of deep relaxation.***

Education

Commodore's own *Visible Solar System* for the 64 and the VIC gives an accurate feel for the solar system by providing views of planet rotation. In the first part of the program, you are in a spaceship able to move to any vantage point. In the second part, you see a close-up of Earth, Mars, Jupiter and Saturn. And in the final section, the Planetary Computer displays the numerical data stored for each of the nine planets, including the planet's radius, length of its day and year, number of moons, orbital and escape velocities and atmospheric pressures.

Timeworks (405 Lake Cook Road, Building A, Deerfield, IL 60015) has released *Evelyn Wood Dynamic Reading* for the 64. Targeted to improve reading comprehension, retention and speed, this program records the user's progress. You set the speed for the reading exercises, so the challenge is always self-imposed.

Music

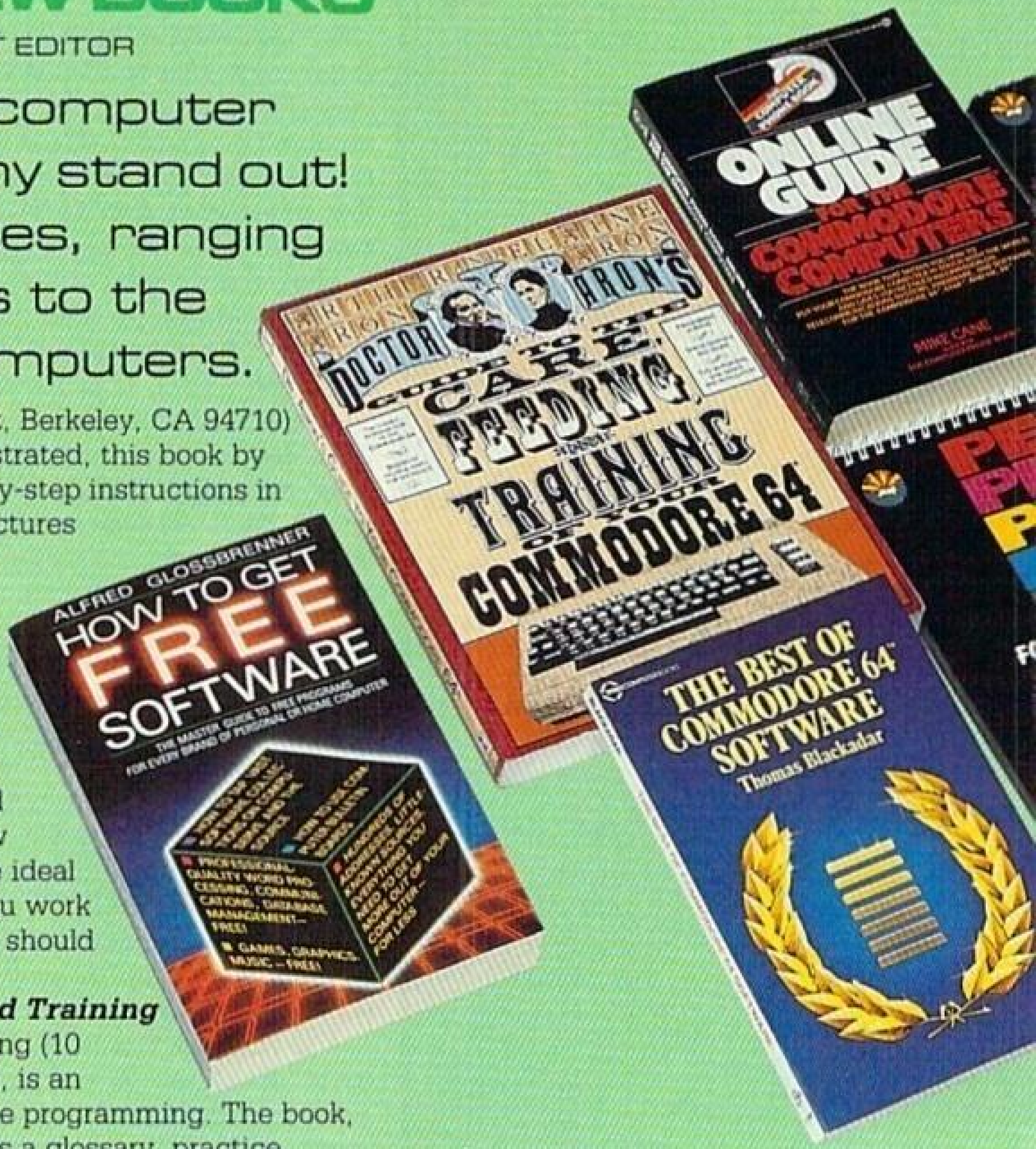
If you're interested in music, try Electronic Arts' (2755 Campus Drive, San Mateo, CA 94403) *Music Construction Set* for the 64. This program allows graphic composition on the screen with immediate playback using the computer's three voices. One press of the fire button on your joystick and the notes become part of your composition.

If you don't want to bother with musical notation, Melodian's (792 Holmdel Road, Holmdel, NJ 07733)

BEST BETS IN NEW BOOKS

BY CAROL MINTON, ASSISTANT EDITOR

With the plethora of computer books, it's a wonder any stand out! Here are some favorites, ranging from beginner's basics to the history of personal computers.


ONLINE GUIDE FOR THE COMMODORE COMPUTERS
MIKE CANE
DOCTOR ARON'S GUIDE TO THE CARE, FEEDING AND TRAINING OF YOUR COMMODORE 64
ALFRED GLOSSBRENNER
HOW TO GET FREE SOFTWARE
THE BEST OF COMMODORE 64 SOFTWARE
Thomas Blackadar

Power Up! from Sybex Books (2344 Sixth Street, Berkeley, CA 94710) is a kid's guide to the Commodore 64. Aptly illustrated, this book by Marty DeJonghe and Caroline Earhart has step-by-step instructions in understandable language. Learn how to draw pictures and designs, change colors and shapes, create simple animated movies and write adventure games. An excellent choice for kids who are new to computers.

Enrich/Ohaus (2325 Paragon Drive, San Jose, CA 95131) has released two books for the beginner: ***Commodore 64 for the Beginning Beginner*** by Flora Russ and Matthew Foley and ***PET for the Beginning Beginner*** by Matthew Foley. Packaged like steno pads, these books are ideal to set up right along side of your computer as you work through the lessons. By the end of the book, you should be able to write your own small program.

Dr. Aron's Guide to the Care, Feeding and Training of Your Commodore 64 from Hayden Publishing (10 Mulholland Drive, Hasbrouck Heights, NJ 07604), is an introduction to the 64 which includes a little more programming. The book, written by Arthur Aron and Elaine Aron, includes a glossary, practice exercises, graphics, sound programming and hints for using POKEs and sprites. Also featured are programs for auto maintenance, scheduling and meal planning.

full-sized, three-octave keyboard may be just the thing. It comes with software that turns your standard 64 into a music synthesizer. There are 16 prerecorded instrument sounds available and the combinations are unlimited. It also helps children and adults learn how to read music and develop a sense of pitch and rhythm.

Graphics

Feeling artistic? Try a graphics tablet! Graphics tablets create sophisticated graphics without the use of a keyboard. Koala Technologies (3100 Patrick Henry Drive, Santa Clara, CA 95052) has a great one for the 64 called the KoalaPad. This sketch pad allows the user to control the computer input by moving a finger or stylus across its touch-sensitive surface. The result then appears on the video screen. The tablet is light and can be held comfortably in your lap. Another touch tablet for the 64 is also available from *Chalk Board.*

Interested in trying a light pen? The only difference between a graphics tablet and a light pen is that the light pen works directly on the video screen to create the artwork. Inkwell, TechSketch, Madison, Futurehouse and Activision make light pens for the 64 that offer great versatility when it comes to letting your mind go.

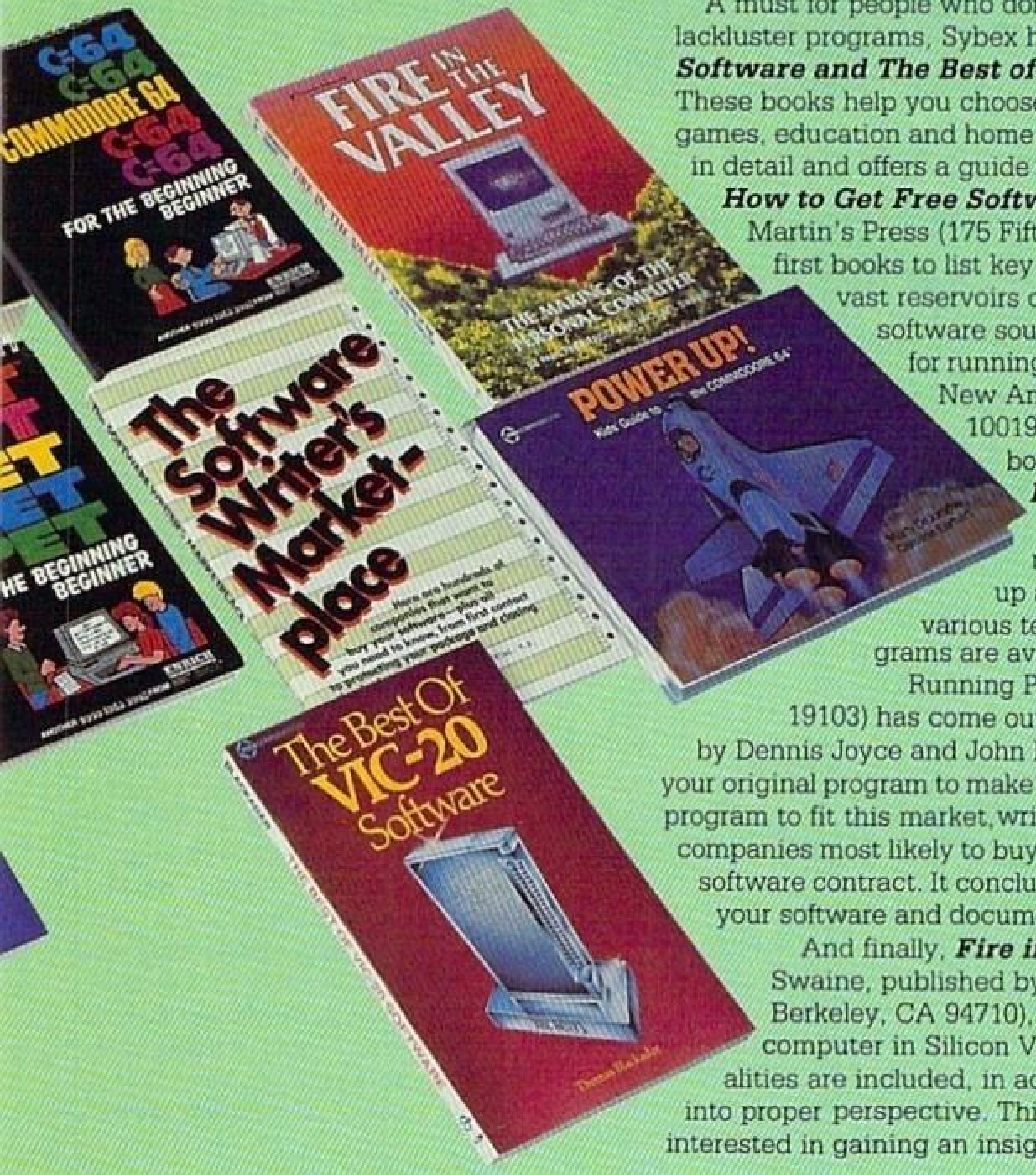
Home Application

Commodore offers a unique program for the 64 which makes your home an automated office. *The Magic Desk* series uses pictures instead of text commands for a simple word processor, spreadsheet, file manager, calculator and home budget. Using this method, work becomes pleasure.

Another excellent program for the 64 from Commodore is the *Micro Cookbook.* This program effectively helps organize your kitchen. Store and update hundreds of recipes, select a recipe by ingredients alone, prepare shopping lists, print recipes, access nutritional and cooking information, and adjust recipes for the number of servings. The program also features a glossary, calorie/nutrition guide, table of measurements and equivalents, table of ingredient substitutions and food buying, storing and cooking tips.

Arrays/Continental (11223 South Hindry Avenue, Los Angeles, CA 90045) has recently introduced a four-volume series of personal finance programs for the 64 called *Get Rich.* Each

Continued on pg. 129


C-64
COMMODORE 64
FOR THE BEGINNING BEGINNER
FIRE IN THE VALLEY
THE MAKING OF THE PERSONAL COMPUTER
POWER UP!
Kids Guide to the Commodore 64
The Software Writer's Marketplace
The Best Of VIC-20 Software

A must for people who don't want to waste their time and money on lackluster programs, Sybex has published ***The Best of Commodore 64 Software and The Best of VIC 20 Software*** by Thomas Blackadar. These books help you choose the best software for video games, strategy games, education and home management. The book reviews each program in detail and offers a guide to its use.

How to Get Free Software by Alfred Glossbrenner, published by St. Martin's Press (175 Fifth Avenue, New York, NY 10010), is one of the first books to list key addresses, contacts and techniques to tap the vast reservoirs of public domain software. It also includes free software sources from magazines and newsletters and tips for running different computer programs on your system.

New American Library (1633 Broadway, New York, NY 10019) has published a telecommunications handbook by Mike Cane called ***The Computer Phone Book Online Guide.*** Of use to any Commodore user, this guide discusses what online communication involves, the steps necessary to set up a telecommunications terminal, how to use the various telecommunications networks and what programs are available from CompuServe.

Running Press (125 South 22nd Street, Philadelphia, PA 19103) has come out with ***The Software Writer's Marketplace*** by Dennis Joyce and John Earl Pickering. This book explains how to create your original program to make it saleable, research the market, structure your program to fit this market, write your documentation, make contact with companies most likely to buy your software, write a query letter and read a software contract. It concludes by offering copyright advice for protecting your software and documentation.

And finally, ***Fire in the Valley*** by Paul Frieberger and Michael Swaine, published by Osborne/McGraw-Hill (2600 Tenth Street, Berkeley, CA 94710), traces the meteoric rise of the personal computer in Silicon Valley. Interviews with major industry personalities are included, in addition to photos and a timeline to put things into proper perspective. This book is an excellent choice for anyone interested in gaining an insight into the computer industry. C

· BY MICHAEL E. KNOTTS

Musical Sprites for the Commodore 64

If you have been intrigued by articles about the fascinating sound and graphics capabilities of the Commodore 64, perhaps you have written a few demonstration programs. The BASIC interpreter provided with the computer is usually sufficient for producing simple graphics or playing simple tunes. However, BASIC is much too slow for more complicated tasks such as combining sprite graphics and fast-paced three-part music. A good solution to this problem is to use a machine code routine to handle the graphics and the sound generator and let BASIC do the rest. The program described here is just such a hybrid program.

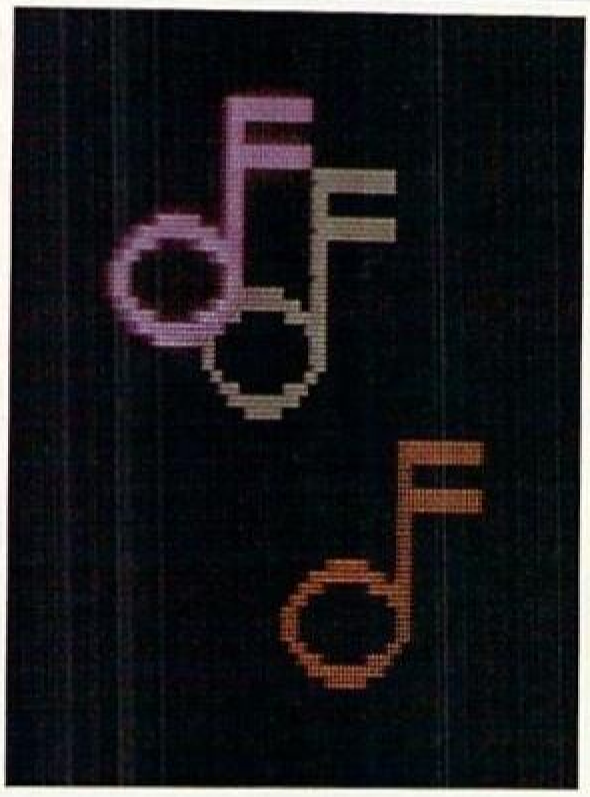
Sinfonia is a relatively short and simple program designed with three objectives. First, to handle very fast, three-part music with ease. Second, to provide a pleasing visual display of the music being played using sprite graphics. Third, to allow the user to change the waveform, attack, decay, sustain, release (ADSR) and pulse rate of each voice and vary the tempo and the key that the music is played in. An additional goal was to allow easy entry of data for new songs.

How the Program Works

Sinfonia starts by poking a short machine code routine into memory locations 50000 to 50506. Then it blanks the screen and begins playing the music which is coded in BASIC data statements. Each of the three voices has a corresponding double-sized, note-shaped sprite that moves up and down the screen and changes color corresponding to the note being played by that voice. The relative heights of the three sprites gives an indication of the position of the notes on the scale and the color of each sprite corresponds to a specific note. For example, all C's will display a medium grey sprite and all F's will display a green sprite.

How to Use the Program

If you wish to hear the demonstration piece by Bach, simply type the program in as listed and RUN it. To change the tempo, adjust the variable SF (speed factor) in line 2. To change the key, adjust the variables 01, 02 and 03 in line 2. These variables determine the offset, in half-steps above or below the value for which the music was coded, at which the respective voices play. For example, 01 = +12:02 = +00:03 = −12 will spread the three voices out, voice one playing an octave above the normal value and voice three playing an octave below. The voices in the program are set to sound somewhat like a harpsichord. To change them, change the appropriate values for waveform, pulse rate, attack (0-15), decay (0-15), sustain (0-15), and release (0-15). The variables in lines 3, 4 and 5 set the voice parameters for voice one, two and three respectively.



Create fast-paced three-part music with ease and add some colorful sprites as well.

It is very simple to enter your own selections if you can read music. Start by loading a version of the program without the music data statements after line 999. (It would be a good idea to save a version of this program without the music data.)

Coding of notes is done in triad form. Each triad consists of a time value (first), followed by a note number for each of the three voices (voice one first). The time value is a number based on an arbitrary scale picked for convenience; it is the number of 1/60 second clock pulses that a set of notes is held. For example, it is convenient to use a timing factor of 64 beats per measure. That way, a duration of one represents a 1/64 note, a duration of four represents a 1/16 note and so on. A time value of zero signals the end of the music and tells the program to stop. The note numbers following the time value are simply the sequence numbers of the desired frequencies, taken from Appendix M of the *Commodore 64 User's Guide*. If you have a recent edition of the *User's Guide*, you will notice that the sequence numbers are not entirely accurate. For the purposes of using Sinfonia, you can renumber them yourself starting with 95 for the first note (C-0), then numbering the notes from one to 94 in sequence.

It is not necessary to put high and low frequency values in the data; instead single numbers represent each note and the machine code routine sets the appropriate high and low frequency registers. If one or more of the three voices is not to change, that voice should be given a sequence number zero. To play the lowest note of which the chip is capable, substitute sequence number 95. To turn off a voice, use 255 for the note number.

For an example of how this music coding scheme works, look at the first few lines of Sinfonia. Beginning at line 1000, the coding for the first few notes is explained in REMarked statements. Using this coding scheme and player, you can easily get your Commodore 64 to play a wide variety of music.

Continued on pg. 100

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MUSICAL SPRITES

```
1 REM *** PLAYER (NO MUSIC DATA)
  ***'BAYF
2 GOSUB 51:GOSUB 16:M=0:SF=1.5:O1=+00
  :O2=+00:O3=+00'KEIN
3 WF(0)=33:PR(0)=0400:AT(0)=00
  :DC(0)=02:SU(0)=13:RL(0)=00
  :GOSUB 25'HCKQ
4 WF(1)=33:PR(1)=0400:AT(1)=00
  :DC(1)=02:SU(1)=13:RL(1)=00
  :GOSUB 29'HCUR
5 WF(2)=33:PR(2)=2000:AT(2)=00
  :DC(2)=02:SU(2)=13:RL(2)=00
  :GOSUB 33'HCTS
6 GOSUB 12:GOSUB 37:T=TI'DJDH
7 READ S:IF S=0 GOTO 11'EGPI
8 READ X,Y,Z:POKE N1,X:POKE N2,Y
  :POKE N3,Z:SYS SA:T=T+S*SF'IEXS
9 IF T>TI THEN 9'DENK
10 GOTO 7'BBQW
11 FOR J=L1 TO 54296:POKE J,0:NEXT J
   :END'GPWE
12 IF X<0 THEN POKE V1,WF AND 254'FKHE
13 IF Y<0 THEN POKE V2,WF AND 254'FKJF
14 IF Z<0 THEN POKE V3,WF AND 254'FKLG
15 RETURN'BAQC
16 L1=54272:L2=54279:L3=54286'DXCK
17 H1=L1+1:H2=L2+1:H3=L3+1'GRDM
18 V1=L1+4:V2=L2+4:V3=L3+4'GRDN
19 POKE L1,0:POKE H1,0:POKE L2,0
   :POKE H2,0:POKE L3,0:POKE H3,0'GEMP
20 X=-1:Y=-1:Z=-1'GIPE
21 RETURN'BAQY
22 INPUT"LINE NUMBER";S'BCUE
23 PRINT"[CLEAR]";:FOR R=S TO S+38
   STEP 2:PRINT R;"DATA":NEXT'IMEK
24 END'BACC
25 AD(0)=AT(0)*16+DC(0)
   :SR(0)=SU(0)*16+RL(0)'GKTO
26 LP(0)=PR(0)-INT(PR(0)/256)*256
   :HP(0)=INT(PR(0)/256)'IOIR
27 P1=L1+2:Q1=H1+2:POKE P1,LP(0)
   :POKE Q1,HP(0):POKE V1+1,AD(0)
   :POKE V1+2,SR(0)'KYIW
28 RETURN'BAQG
29 AD(1)=AT(1)*16+DC(1)
   :SR(1)=SU(1)*16+RL(1)'GKAS
30 LP(1)=PR(1)-INT(PR(1)/256)*256
   :HP(1)=INT(PR(1)/256)
31 P2=L2+2:Q2=H2+2:POKE P2,LP(1)
   :POKE Q2,HP(1):POKE V2+1,AD(1)
   :POKE V2+2,SR(1)'KYUR
32 RETURN'BAQB
33 AD(2)=AT(2)*16+DC(2)
   :SR(2)=SU(2)*16+RL(2)'GKGN
34 LP(2)=PR(2)-INT(PR(2)/256)*256
   :HP(2)=INT(PR(2)/256)'IOSQ
35 P3=L3+2:Q3=H3+2:POKE P3,LP(2)
   :POKE Q3,HP(2):POKE V3+1,AD(2)
   :POKE V3+2,SR(2)'KYHV
36 POKE 54296,15:T=TI:RETURN'DNPJ
37 SA=50020:XX=50000:POKE XX+3,WF(0)
   :POKE XX+4,WF(1):POKE XX+5,
   WF(2)'IUDV
38 IF O1<0 THEN 1=256-(O1+12)
   :GOTO 38'HQDO
39 IF O2<0 THEN 2=256-(O2+12)
   :GOTO 39'HQHP
40 IF O3<0 THEN 3=256-(O2+12)
   :GOTO 40'HQBH
41 POKE XX+6,O1:POKE XX+7,O2
   :POKE XX+8,O3'GURJ
42 POKE XX+9,20:POKE XX+10,0
   :POKE XX+11,12'GVMK
43 N1=XX:N2=XX+1:N3=XX+2
   :POKE 50012,3'GYXM
44 FOR X=0 TO 62:READ Y:POKE 832+X,Y
   :POKE 896+X,Y:POKE 960+X,Y
   :NEXT'LDKR
45 POKE 2040,13:POKE 2041,14
   :POKE 2042,15'DXOL
46 POKE 53248,135:POKE 53250,155
   :POKE 53252,175'DEWN
47 PRINT CHR$(147):POKE 53280,0
   :POKE 53281,0'EVVN
48 POKE 53277,255:POKE 53271,255'CTCN
49 RETURN'BAQJ
50 END'BACB
51 FOR X=50000 TO 50506:READ A
   :POKE X,A:NEXT'GSTJ
52 RETURN'BAQD
53 REM *** MACHINE CODE DATA'BSEJ
54 DATA 1,2,3,4,5,6,7,8,9,10,11,12,3,
   0,0,0,0,0'BNXM
55 DATA 0,0,8,72,138,72,152,72,216,
   160,0,162,0,32,88,196,32,144'BFSR
56 DATA 195,160,1,162,7,32,88,196,32,
   144,195,160,2,162,14,32,88,196'BJSS
57 DATA 32,144,195,104,168,104,170,
   104,40,96,185,80,195,240,91,173,21,
   208'BPSV
58 DATA 57,246,195,141,21,208,185,80,
   195,201,255,240,75,138,72,152,10,
   170'BPVW
59 DATA 173,92,195,208,2,169,2,141,
   241,195,185,80,195,141,242,195,206,
   241'BPFX
60 DATA 195,240,7,24,109,242,195,76,
   186,195,141,242,195,173,89,195,56,
   237'BPJP
61 DATA 242,195,157,1,208,185,80,195,
   170,189,249,195,205,90,195,208,3,
   173'BPYQ
62 DATA 91,195,153,39,208,104,170,173,
   21,208,25,243,195,141,21,208,96,
   0'BNWQ
63 DATA 108,1,2,4,254,253,251,0,1,2,3,
   4,5,6,7,8,9,10'BTRN
64 DATA 11,0,1,2,3,4,5,6,7,8,9,10,11,
   0,1,2,3,4'BNEN
65 DATA 5,6,7,8,9,10,11,0,1,2,3,4,5,6,
   7,8,9,10'BNDO
66 DATA 11,0,1,2,3,4,5,6,7,8,9,10,11,
   0,1,2,3,4'BNEP
67 DATA 5,6,7,8,9,10,11,0,1,2,3,4,5,6,
   7,8,9,10'BNDQ
68 DATA 11,0,1,2,3,4,5,6,7,8,9,0,185,
   80,195,240,45,169'BVGT
69 DATA 0,157,4,212,185,80,195,201,
   255,240,33,152,72,185,80,195,24,
   121'BMQX
70 DATA 86,195,153,80,195,168,185,235,
    196,157,0,212,185,139,196,157,1,
    212'BPAQ
71 DATA 104,168,185,83;195,157,4,212,
    96,1,1,1,1,1,1,1,1,1'BYQN
72 DATA 1,1,2,2,2,2,2,2,2,3,3,3,3,3,4,
    4,4,4'BKDL
73 DATA 5,5,5,6,6,6,7,7,8,8,9,9,10,10,
    11,12,12,13'BQCO
74 DATA 14,15,16,17,18,19,20,21,22,24,
    25,27,28,30,32,34,36,38'BDRR
75 DATA 40,43,45,48,51,54,57,61,64,68,
    72,76,81,86,91,96,102,108'BFIT
76 DATA 115,122,129,137,145,153,163,
    172,183,193,205,217,230,244,1,18,
    35,52'BQIW
77 DATA 70,90,110,132,155,179,205,233,
    6,37,69,104,140,179,220,8,54,
    103'BMQW
78 DATA 155,210,12,73,139,208,25,103,
    185,16,108,206,53,163,23,147,21,
    159'BOOX
79 DATA 60,205,114,32,216,156,107,70,
    47,37,42,63,100,154,227,63,177,
    56'BMTY
80 DATA 214,141,94,75,85,126,200,52,
    198,127,97,111,172,126,188,149,169,
    252'BQSR
81 DATA 161,105,140,254,194,223,88,52,
    120,43,83,247,31,210,25,252,133,
    189'BPLS
82 DATA 176,103,18'BKRI
83 REM *** SPRITE DATA'BNDK
84 DATA 0,3,255,0,3,255,0,3,0,0,3,0,0,
    3,255,0,3,255,0,3,0,0,3,0,0,3,
    0'BLNT
85 DATA 0,3,0,3,227,0,15,251,0,28,31,
    0,48,7,0,96,3,0,96,3,0,96,3,0'BIYU
86 DATA 48,6,0,28,28,0,15,248,0,3,224,
    0'BGHQ
996 REM'BARS
997 REM *** MUSIC DATA STARTS
    HERE'BWWA
998 REM'BARU
997 REM ***    MUSIC DATA FOR
    ***'BSNY
998 REM ***    HANDEL FUGUE 1
    ***'BSCY
999 REM'BARV
1000 DATA 24,60,255,255,8,64,0,0,8,65,
     0,0,8,62,0,0,8,67'BUDC
1002 DATA 0,0,8,65,0,0,8,64,0,0,8,60,
     0,0,8,64,0,0'BOLC
1004 DATA 8,66,0,0,8,67,55,0,8,62,0,0,
     8,67,0,0,8,0'BPFF
1006 DATA 62,0,8,0,60,0,8,0,57,0,8,66,
     62,0,8,0,60,0'BQQH
1008 DATA 8,67,59,0,8,0,55,0,8,0,57,0,
     8,65,59,0,8,64'BREJ
1010 DATA 60,48,8,0,55,0,8,0,60,0,8,
     64,0,52,8,62,0,53'BSCC
1012 DATA 8,0,0,50,8,0,59,55,8,0,0,53,
     8,64,60,52,8,0'BRFE
1014 DATA 0,48,8,0,0,52,8,0,0,54,8,62,
     59,55,8,0,50,50'BSFG
1016 DATA 8,0,55,43,8,0,59,47,8,64,55,
     48,8,0,0,45,8,62'BTCJ
1018 DATA 54,50,8,0,0,48,8,62,55,47,8,
     0,0,43,8,62,55,45'BUOL
1020 DATA 8,0,0,47,8,0,52,48,8,0,0,47,
     8,60,57,45,8,0'BRND
1022 DATA 0,43,8,60,50,42,8,0,0,38,8,
     59,55,43,8,0,0,31'BTDF
1024 DATA 8,57,55,40,8,0,0,36,8,0,54;
     38,8,0,0,26,16,55'BTNH
1026 DATA 55,31,8,0,255,43,8,59,0,0,8,
     60,0,0,8,57,0,0'BSAJ
1028 DATA 8,62,0,42,8,60,0,0,8,59,0,
     43,8,55,0,0,8,57'BRIL
1030 DATA 0,0,8,59,0,41,8,60,48,40,8,
     55,0,0,8,60,0,36'BSBE
1032 DATA 8,0,52,0,8,0,53,38,8,0,50,0,
     8,59,55,0,8,0'BQCG
1034 DATA 53,0,8,0,52,36,8,0,48,0,8,
     57,53,0,8,0,52,0'BRAI
1036 DATA 8,0,50,35,8,0,47,0,8,55,52,
     0,8,0,50,0,8,0'BQSK
1038 DATA 48,33,8,0,45,0,8,53,50,0,8,
     0,48,0,8,0,47,31'BSCM
1040 DATA 8,0,43,0,8,52,48,0,8,0,47,0,
     8,0,45,29,8,0'BQEF
1042 DATA 48,0,8,50,47,0,8,0,45,0,8,0,
     44,28,8,0,40,0'BRVH
1044 DATA 8,48,45,0,8,0,40,0,8,47,44,
     0,8,0,40,0,8,52'BRAJ
1046 DATA 48,24,8,0,47,0,8,0,45,29,8,
     0,48,0,8,50,47,0'BSML
1048 DATA 8,0,45,0,24,52,44,28,8,255,
     59,255,8,0,60,45,8,0'BWOO
1050 DATA 57,0,8,0,62,42,8,0,60,0,8,0,
     59,43,8,0,55,0'BRAG
1052 DATA 8,0,60,52,8,64,0,0,8,65,0,
     50,8,62,0,0,8,67'BRFI
1054 DATA 59,0,8,65,0,0,8,64,0,48,8,
     60,0,0,8,65,57,0'BRNK
1056 DATA 8,64,0,0,8,62,0,47,8,59,0,0,
     8,64,55,0,8,62'BRQM
1058 DATA 0,0,8,60,0,45,8,57,0,0,8,62,
     52,0,8,60,0,0'BQMO
1060 DATA 8,59,0,43,8,55,0,0,8,60,50,
     0,8,59,0,0,8,57'BRNH
1062 DATA 0,41,8,60,0,0,8,59,48,0,8,
     57,0,0,8,56,0,40'BRBJ
1064 DATA 8,52,0,0,8,57,48,41,8,0,0,
     38,8,0,47,40,8,0'BRHL
1066 DATA 0,38,8,56,0,40,8,0,0,28,16,
     57,48,33,8,60,255,0'BVGO
1068 DATA 8,0,0,40,8,0,57,41,8,0,0,38,
     8,59,55,43,8,0'BRIP
1070 DATA 0,41,8,60,48,40,8,0,0,36,8,
     255,48,40,8,0,0,42'BUVJ
1072 DATA 8,0,47,43,8,0,0,38,8,0,255,
     43,8,59,0,0,8,60'BSLK
1074 DATA 0,0,8,57,0,0,8,62,0,42,8,60,
     0,0,8,59,0,43'BQRM
1076 DATA 8,55,0,0,8,60,52,255,8,0,0,
     40,8,0,50,41,8,0'BSRO
1078 DATA 0,38,8,59,0,43,8,0,0,41,8,0,
     48,40,8,0,0,36'BRYQ
1080 DATA 8,57,0,41,8,0,0,40,8,0,47,
     38,8,0,0,35,8,55'BRGJ
```

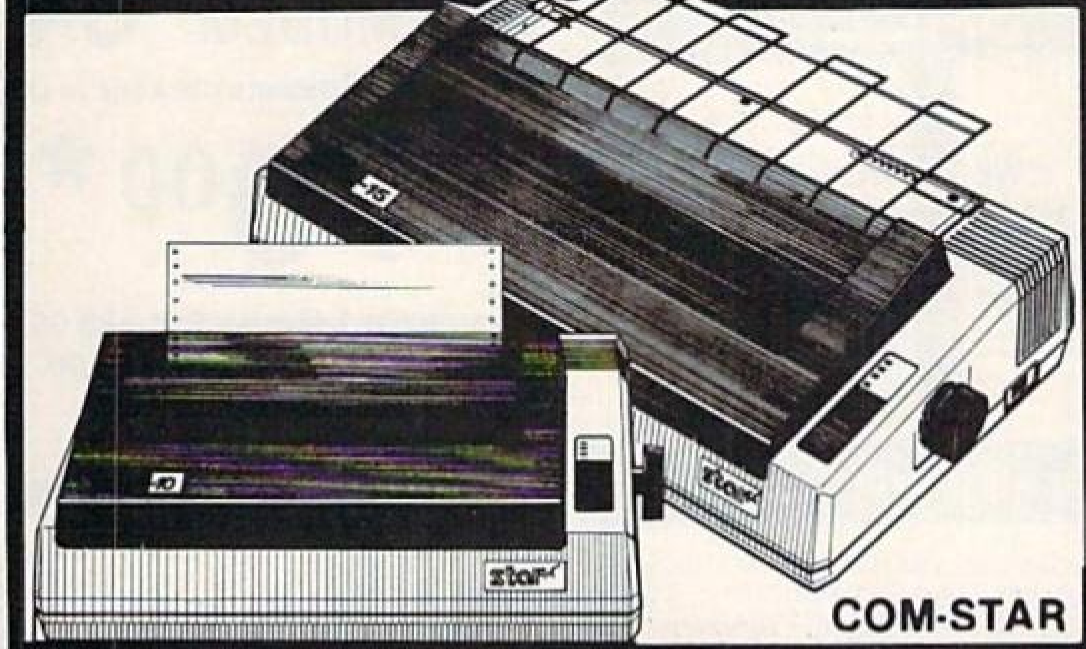
Continued on pg. 102

```
1082 DATA 0,40,8,0,0,38,8,0,45,36,8,0,
     0,33,8,53,0,38'BRUL
1084 DATA 8,0,0,36,8,0,43,35,8,0,0,31,
     8,52,0,36,8,0'BQQN
1086 DATA 0,31,8,50,43,35,8,0,0,31,8,
     64,55,36,8,0,0,31'BTTP
1088 DATA 8,65,55,38,8,0,0,31,8,64,0,
     36,8,0,0,31,8,62'BSKR
1090 DATA 55,35,8,0,0,31,9,60,52,40,
     10,0,0,36,22,60,50,43'BWCL
1092 DATA 28,59,0,31,50,60,52,24,1,
     255,255,255,0'BNDL
```

```
997 REM   ***   MUSIC DATA FOR
    ***'BSNY
998 REM   ***   HANDEL FUGUE 6
    ***'BSHY
999 REM'BARV
1000 DATA 32,60,255,48,16,62,0,0,16,0,
     0,47,8,64,0,48,8,65'BWGC
1002 DATA 0,0,8,67,0,0,8,59,0,50,8,60,
     0,52,8,55,0,0'BQTD
1004 DATA 8,58,0,0,8,0,0,48,8,57,0,53,
     8,59,0,0,16,60'BRJF
1006 DATA 0,52,16,0,0,50,12,59,0,0,2,
     57,0,48,2,59,0,50'BTJH
1008 DATA 8,60,52,36,8,0,53,0,8,60,55,
     0,8,0,52,0,8,0'BRXJ
1010 DATA 53,38,8,0,52,0,8,59,53,0,8,
     0,50,0,8,60,55,40'BTGC
1012 DATA 8,0,0,41,8,0,0,43,8,62,0,35,
     8,64,0,36,8,0'BQTE
1014 DATA 0,31,8,0,0,34,8,60,0,0,8,65,
     60,33,8,0,0,35'BRKG
1016 DATA 8,64,255,36,8,0,55,0,8,62,
     53,0,8,0,57,0,8,0'BSMI
1018 DATA 55,35,8,0,53,0,8,60,52,36,8,
     0,54,0,16,59,55,43'BVKL
1020 DATA 8,57,0,36,8,64,0,0,8,62,54,
     38,8,60,0,0,8,59'BSWD
1022 DATA 55,40,8,55,0,0,8,57,48,255,
     8,52,0,0,8,54,0,38'BUMG
1024 DATA 8,50,0,0,16,55,47,0,16,0,45,
     0,16,54,0,0,16,55'BUJI
1026 DATA 47,31,16,59,255,43,16,57,0,
     0,16,0,0,42,8,59,0,43'BXDK
1028 DATA 8,60,0,0,8,62,0,0,8,54,0,45,
     8,55,0,47,8,0'BQAL
1030 DATA 0,48,8,0,0,50,8,57,0,42,8,
     59,0,43,8,60,0,0'BRYE
1032 DATA 8,62,0,0,8,54,0,45,8,55,0,
     47,8,0,0,48,8,0'BQGG
1034 DATA 0,50,8,57,0,42,8,59,0,43,8,
     60,0,0,8,62,0,41'BSXI
1036 DATA 8,55,0,0,16,60,255,40,16,0,
     48,0,16,62,0,41,16,0'BWHL
1038 DATA 47,43,8,64,48,36,8,65,0,0,8,
     67,0,255,8,59,50,0'BVCN
1040 DATA 8,60,52,0,8,0,53,0,8,0,55,0,
     8,62,47,0,8,64'BRFF
1042 DATA 48,0,8,65,0,0,8,67,0,0,8,59,
     50,0,8,60,52,0'BRFH
1044 DATA 8,0,53,0,8,0,55,0,8,62,47,0,
     8,64,48,0,8,65'BRPJ
1046 DATA 0,0,8,67,0,46,8,60,0,0,8,65,
     53,45,8,0,0,48'BRGL
1048 DATA 8,65,0,45,8,0,0,41,8,0,0,46,
     8,0,0,43,8,64'BQYN
1050 DATA 0,48,8,0,0,36,8,65,57,41,8,
     0,58,0,8,255,60,0'BTNG
1052 DATA 8,0,52,43,8,60,53,45,8,0,50,
     0,8,255,51,0,8,0'BTBI
1054 DATA 0,41,8,53,50,46,8,55,52,0,
     16,57,53,45,16,58,0,43'BXLL
1056 DATA 16,0,52,36,8,57,53,41,8,59,
     0,0,16,60,55,40,16,65'BXKN
1058 DATA 60,38,8,0,59,43,4,64,0,0,4,
     62,0,0,16,64,60,36'BUXP
1060 DATA 8,0,55,48,8,64,0,0,8,62,55,
     47,8,0,54,0,8,0'BRPH
1062 DATA 56,40,4,60,0,0,4,59,0,0,8,
     60,57,33,8,0,52,0'BSSJ
1064 DATA 8,0,53,45,8,60,0,0,8,59,0,
     44,8,0,51,0,8,0'BQXL
1066 DATA 52,43,8,59,0,0,8,57,0,42,8,
     0,49,0,8,0,50,41'BSEN
1068 DATA 8,57,0,0,8,56,50,40,8,52,0,
     0,16,57,48,41,16,0'BUZQ
1070 DATA 47,38,16,56,0,40,8,57,255,
     33,8,0,45,0,8,0,47,0'BVJJ
1072 DATA 8,0,49,43,8,50,50,41,8,0,0,
     40,8,0,0,38,8,0'BRUK
1074 DATA 0,41,8,0,52,43,8,0,0,40,8,
     49,0,45,8,0,0,33'BRNM
1076 DATA 8,50,53,38,8,0,55,0,8,255,
     57,0,8,0,49,40,8,0'BTQO
1078 DATA 50,41,8,0,45,0,8,0,48,0,8,0,
     0,42,8,0,47,43'BRRQ
1080 DATA 8,0,49,0,16,0,50,41,8,55,0,
     40,8,0,47,0,8,0'BRRJ
1082 DATA 48,39,8,57,0,0,8,54,0,38,8,
     50,0,0,16,55,46,0'BTNL
1084 DATA 16,0,45,0,8,53,0,0,8,0,0,36,
     8,0,43,35,8,0'BQMN
1086 DATA 0,31,16,52,48,36,16,50,0,41,
     16,0,47,43,8,52,48,36'BYCQ
1088 DATA 8,53,0,0,8,55,255,0,8,47,0,
     38,8,48,0,40,8,43'BTQR
1090 DATA 0,0,8,46,0,0,8,0,0,36,8,45,
     0,41,8,47,0,0'BPLK
1092 DATA 16,48,0,40,16,53,41,38,16,0,
     48,33,16,55,50,34,16,0'BASO
1094 DATA 52,36,8,57,53,29,8,58,55,0,
     8,60,57,0,8,55,52,0'BVDP
1096 DATA 8,57,53,0,8,0,48,0,8,0,51,0,
     8,57,0,0,8,58'BQKQ
1098 DATA 50,34,8,0,52,0,16,57,53,38,
     16,55,0,34,16,0,52,36'BXYT
1100 DATA 8,57,53,41,8,59,0,0,8,60,
     255,40,8,0,55,0,8,0'BTMC
1102 DATA 53,38,8,0,52,0,8,59,50,43,8,
     0,53,0,8,60,52,36'BUHF
1104 DATA 8,0,55,0,8,0,52,48,8,0,48,0,
     16,62,53,0,16,0'BSXG
1106 DATA 0,47,8,64,52,36,8,65,0,0,8,
     67,48,0,8,60,0,0'BSOI
1108 DATA 8,65,0,38,8,64,0,0,8,65,47,
     0,8,62,0,0,8,60'BRNK
1110 DATA 255,40,8,0,0,41,8,0,0,43,8,
     62,0,35,8,64,0,36'BTVD
```

Continued on pg. 118

FANTASTIC COMPUTER PRINTER SALE!!!



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Has all the features of the 10" COM-STAR PLUS+ PRINTER plus 15½" carriage and more powerful electronics components to handle large ledger business forms! (Better than Epson FX 100). List $599

SALE $349.00

Superior Quality 10" COM-STAR+ H.S. HIGH SPEED 160-180 CPS Business Printer $369.00

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Olympia

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*less coupon discount

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80 COLUMN BOARD $99.00

Now you program 80 COLUMNS on the screen at one time! Converts your Commodore 64 to 80 COLUMNS when you plug in the 80 COLUMN EXPANSION BOARD!! PLUS 4 slot expander! Can use with most existing software.

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(Examples)

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20,000 Word Dictionary	$24.95	$14.95	$10.00
Electronic Spread Sheet	$59.95	$49.00	$39.00
Accounting Pack	$49.00	$39.00	$29.00
Practicalc	$59.95	$44.95	$36.95
Programmers Reference Guide	$20.95	$16.95	$12.50
Programmers Helper (Disk)	$59.95	$39.95	$29.95
80 Column Screen (Disk)	$59.95	$39.95	$29.95
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Pro Joy Stick	$24.95	$15.95	$12.00
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For Com-64 or VIC-20 computers. Just plug it in and your can program words and sentences, adjust volume and pitch, make talking adventure games, sound action games and customized talkies!! FOR ONLY $19.95 you can add TEXT TO SPEECH, just type a word and hear your computer talk—ADD SOUND TO "ZORK", SCOTT ADAMS AND AARDVARK ADVENTURE GAMES!! (Disk or tape).

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Increases VIC-20 programming power 4 times. Expands total memory to 41K (41,000 bytes). Memory block switches are on outside cover! CARDCO Includes FREE $29.95 game!!

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COMMODORE 64

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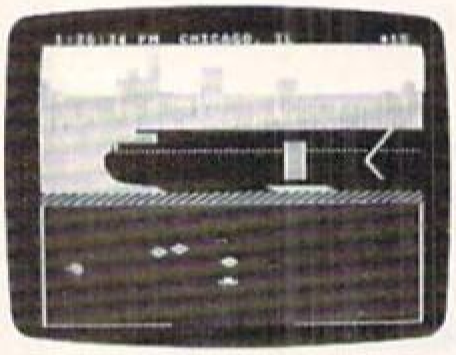
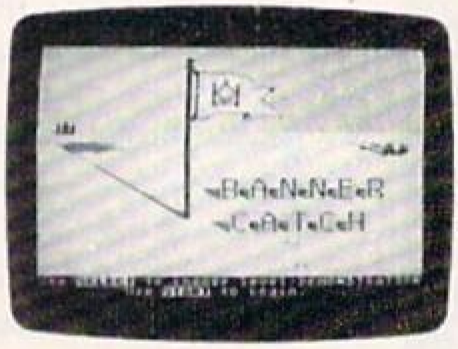
0800 Agent U.S.A. Agent USA challenges the player to intercept the Fuzzbomb by travelling across the U.S.A. You must use your knowledge of time zones, state capitals, geography, map reading, and route planning to achieve your goal. Fantastic adventure game with full color graphics and excellent sound. (Disk.) List $34.95. **Sale $24.95.**



0804 Banner Catch. This one even teaches Binary numbers. Players must work together as a team in this capture the flag game where you must get Max's flag before his robot raiders get yours. Fantastic play action and teamwork and cooperation skills make this a must for everyone. (Disk.) List $34.95. **Sale $24.95.**



0808 Spell Diver. Sharpen spelling skills, improve reading, word recognition and retention. The player is a diver who must explore the ocean floor to find and uncover letters. The more quickly a player can guess a word the more points are scored. Sea creatures and other dangerous surprises plus a time limit make it more exciting. Fantastic graphics and sound. (Disk.) List $34.95. **Sale $24.95.**

0812 Double Feature Adventure. Two full color graphic adventures that allow the player to choose among danger, humor, excitement and chance. Plus these programs make the players stars of the adventure. Explore the microzone or the Northwoods while improving reading skills and building vocabulary. (Disk.) List $29.95. **Sale $17.95.**

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RON KLUG
Press SPACE BAR to continue

0816 Tales Of Mystery. Two more famous twist-a-plot adventures that challenge the player first, to find a friend lost in a haunted house. Second, to find a statue stolen from an island. Fantastic graphic adventures. (Disk.) List $29.95. **Sale $17.95.**

Mystery
AT
Pinecrest
Manor

0820 Square Pairs. Sharpen and improve your vocabulary, reading, and spelling skills while improving deduction and memory. You must match characters in the ready to play games then you can create your own. (1 to 4 players.) (Disk.) List $29.95. **Sale $17.95.**

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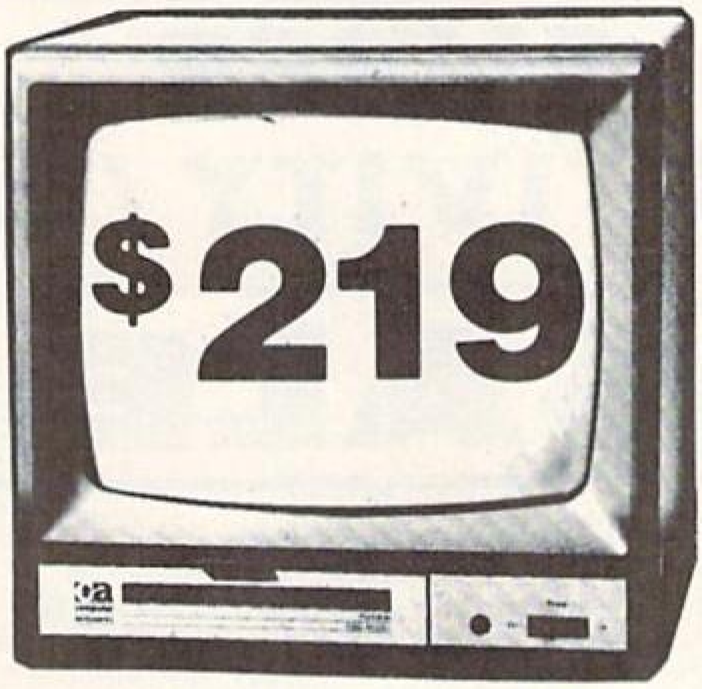

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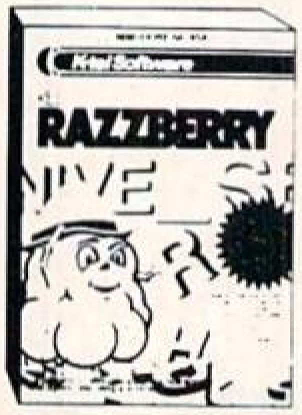

Red Razzberry — Fantastic educational game that teaches spelling and good sentence structure. First you must pick the missing letter for the word (correct spelling) then you must pick the two missing letters for the word. Finally you must pick the correct word for the grammatically correct sentence. Great for students and adults. List $24.99. **Sale $16.95**. (Disk).

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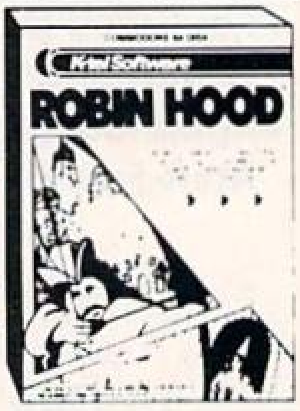

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Ice Palace — You as the Penguin must make your way through the automated Ice Block Factory on your way to your true love. 3 screens worth of melting ice blocks, deadly snowballs, and Freddies Fire Demons try to stop you. Plus you must eat the fruit to keep your strength up and build an ice ladder before your love can be yours again. Fantastic graphics and action. List $24.95. **Sale $19.95**. (Disk)

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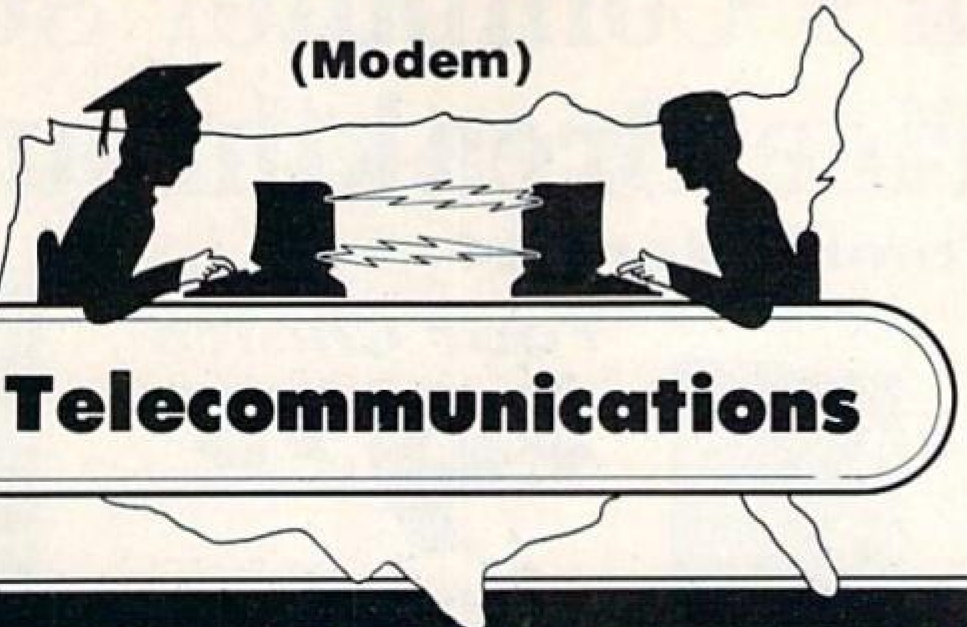

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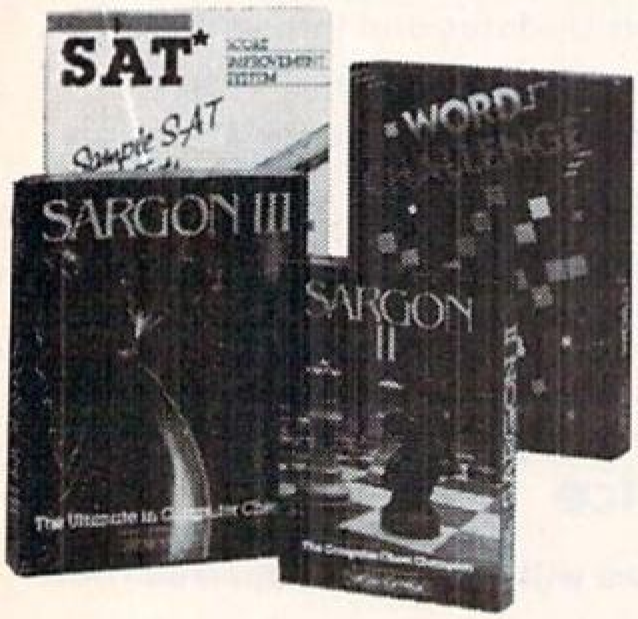

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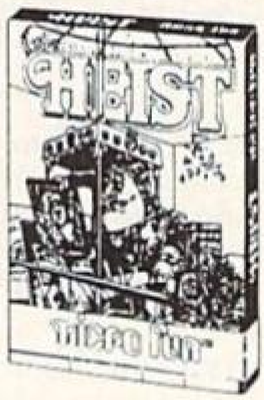

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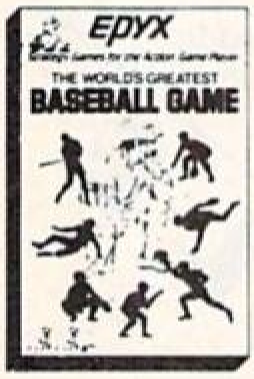
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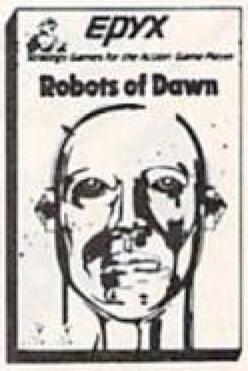
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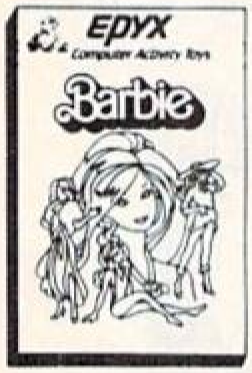
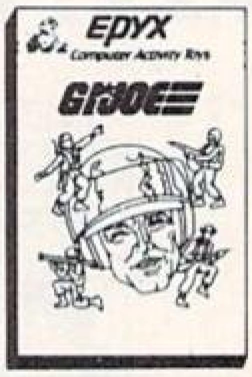


Barbie — The biggest name in dolls. Browse through Barbie's closet full of beautiful clothing and dress her for the party. You can cut her hair or make it longer and color it or change the style. Buy new clothing at the boutique or any of the six other specialty shops, or even go to the dress shop and create Barbie's designer clothes with the help of the computer. The combinations are endless and so is the fun. One or two players. (Disk) List $39.95. **Sale $27.95.**



G.I. Joe — The best selling toy soldier is now available as an activity toy on the home computer. Select the battle situation then choose the equipment you think you will need to get the job done. Choose from a number of uniforms and weapons in your well stocked arsenal and get ready for the action. Play alone or with a friend, if you plan the right strategy you will complete the mission if not you will have to try again. One or two players. (Disk) List $39.95. **Sale $27.95.**

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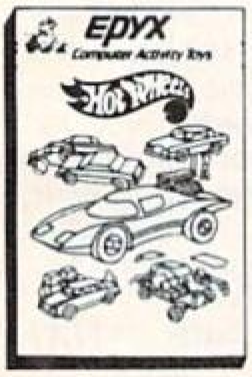
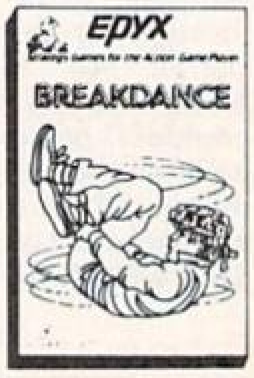


Hot Wheels — Now all the action and fun from playing with Hot Wheels cars is taken one step further on the home computer. Hot Wheels lets you choose your play activity from repairing cars to the destruction derby. You can actually play the activities along with a partner on the computer screen, even build and customize your own cars. A whole new way to play Hot Wheels. One or two players. (Disk) List $39.95. **Sale $27.95.**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Break Dance — Break Dance is an action game in which your dancer tries to break through a gang of break dancers descending on him. "A simon-like game" where your dancer has to keep the steps of the computer controlled dancer, and even a free dance segment where you develop your own dance routines and the computer plays them back for you to watch. Now anyone can break dance!! (Disk) List $39.95 **Sale $27.95.**

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BY JERRY A. STURDIVANT

Blackjack

For Commodore 64 and PET

The program is fixed to repeat your previous bet when you hit RETURN or allow you to enter a different bet.

Be careful, though, when entering the program. Various portions are seldom used (push on split, push on down for double) and a mistake may not show up for a long time.

The Program

After coming back from game information, you are given money (MO = 1000) at line 80. The deck of cards is reshuffled by redimensioning, which means we have to clear the old one. Of course when we clear, we lose track of the money you have, so when we come in at line 110 to shuffle, we put your money into the bank (memory) at line 130, clear all the variables, shuffle, then take the money back out (210).

Because some people may bet odd dollars and blackjack pays 1.5 to one, we could end up with an odd .5 (50 cents) to be banked. We solve this by multiplying by 10 to remove the decimal before banking and dividing by 10 at withdrawal.

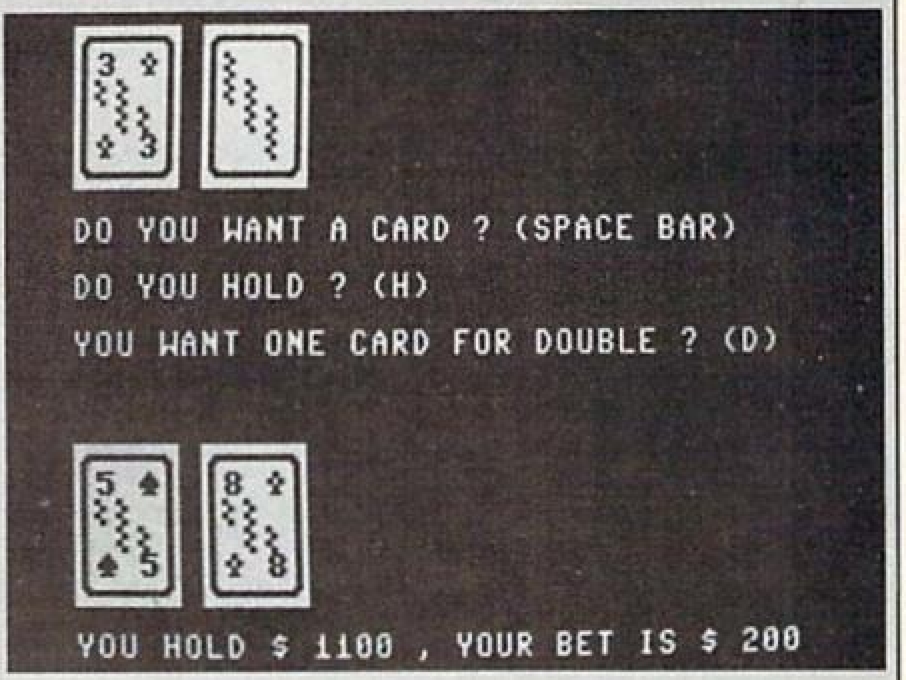
Dealing of the two hands starts at line 280. The dealer is at the top of the screen and you are at the bottom. At line 400, T is the tab for card location. Subroutine 970 is multiple use; when we come in at line 970 we can get the next card. Lines 990 to 1020 change a number between one and 52 into a number between one and 13 with the proper suit. If we already have a number (the second card of a split or the dealer's down card), we come in the subroutine at line 990.

The next step in line 400, subroutine 1120, puts up a blank card. A is given the value of the card for later counting. Subroutine 1200 prints the number and suit on the card. The number ten is the only double digit and is treated differently, as zero, at line 1200.

The other three cards are dealt in a similar manner: dealer, player, dealer (A,B,C,D). The player has cards A and C, the dealer B and D. In line 430, the player's second card (C) gives its value to QQ in case you split, needing to call the card back later.

Line 490 begins the test for blackjack. Line 710 to 760 gives the player his options. If the player wants a card, we go to 1240 and clear off the options, tab over one place (T = T + 6), get a card and give the number to the score keeper (E). Line 1120 puts the card on the screen, line 1200 draws in the number and suit and line 2720 changes all face card values to tens. At line 1330 your score is TT and is tested to see if you busted. If you had taken a card to double, line 1350 sends you to hold (1430). At hold we tally your score (TT). Line 1460 begins checking for aces and sending you to subroutine 1560 to see if an eleven will better your score (an ace can be a one or an eleven). Line 1580 gives you your best score.

Now we turn up the dealer's card (2820) and play his hand (2350). We test the dealer's total (DT) to see if he had to hold (17 or over) or busted. If he hasn't got 17 yet, we test with aces. If he still can't make it, we turn his elevens back to ones (2430) and go get another card (970), show it and count again. If the dealer gets over 16 without busting, we compare scores (2610), then go to where the money is handled.



```
DO YOU WANT A CARD ? (SPACE BAR)
DO YOU HOLD ? (H)
YOU WANT ONE CARD FOR DOUBLE ? (D)

YOU HOLD $ 1100 , YOUR BET IS $ 200
```

This game is not only good practice for card counters, but fun for everyone. If you are one of those who wonder what the next card would have been, watch—these cards will appear in the original sequence.

The split (1750) requires a flow chart to follow it. In essence, we take the righthand card away and hold it while we play the first hand (QA = 1) and place the next card down (1760). We then play, score and go to the next hand, bringing back the card we took away. Lines 1910 to 1940 tests whether playing the dealer's hand is necessary. We then declare who won what and pay off.

Variations

If you would like to be able to make blackjacks on splits, change 1780 and 1880 to "GOTO 550." All the rest of the programming is in place.

If you would like blackjack to pay double, change line 2310 to MO = MO + BE*2. If you don't want to be bothered with insurance (except for rare occasions for card counters), REM out line 490.

The operation of insurance is for when the dealer has an ace showing. You may bet insurance against a dealer blackjack by putting up additional money of one half your bet as insurance. If the dealer has blackjack, you keep your bet and insurance money. If the dealer does not have blackjack, you lose your insurance money.

It took a lot of testing to try all possible combinations, but by changing values at line 990 to 1020 you can test a lot easier. At line 990 make NU = 1 and you have an extra dozen aces. At line 1000 make NU = 10 and you will have lots of blackjacks. Have fun.

♣♥ BLACKJACK ♠♦

Variables

I = Dim card one to 52.
T = Tab.
R = Total of player card points tested for value <21.
U = Total of dealer's points for testing.
SH = Money being held and not bet.
FB = First blackjack. (Used at Line 630 for separation at line 1910 because SB can turn to two).
TT = Player's score.
NU = N$ number only.
SU = S$ number only.
DO = Double, drops out of "player wants a card" when going down for double.
A = (B, C, etc.) up to P are cards dealt in order.
QQ = Player second card on split.
DB = Dealer blackjack if one.
TA = Score on first hand of split.
QA = One is first hand of split, two is second hand of split.
SR = Used in dealer's hand total test.
DT = Dealer's score for tests.
SM = Player's score for tests.
SB = Blackjack on split, one is first hand, two is second.
ZZ = C%(I) dealer's second card is given this value for turning up later.
MO = Money balance
BE = Amount bet.

C

Blackjack

```
10 GOTO 70:          BLACKJACK'BMJA
20 "[SPACE12,CMDR U11]"'AAOH
30 "[SPACE8]BY JERRY STURDIVANT"'AAOF
40 ""'AAAA
50 "SEE PROGRAM INFORMATION AT
   3280"'AAFJ
60 ""'AAAC
70 GOTO 2950 FOR IN FOR MATI ON'EKXH
80 MO=1000:GOTO 110'CKYH
90 PRINT B$TAB(7)"[DOWN]
   --- PRESS SPACE BAR ---"'CEEM
100 GET W$:IF W$=""THEN 100'EITY
110 MO=MO*10:REM SHUFFLE COME IN
    HERE'DYVE
120 POKE 835,0:POKE 834,0
    :POKE 836,0'DRTC
130 D=INT(MO/256):POKE 835,D
    :POKE 834,MO-D*256:POKE 836,
    BE'IHMK
140 PRINT"[CLEAR]":CLR'CBDB
150 A$="[HOME,DOWN16]"'BCHC
160 B$=LEFT$(A$,11)'CJKE
170 C$=LEFT$(A$,8)'CIAE
180 D$="[SPACE39]"'BCYI
190 QQ$="A234567890JQK"'BDKI
200 VV$="[SHFT S,SHFT X,SHFT Z,SHFT A]
    "'BDDA
205 Z$="[LEFT3,DOWN3,RVS]"'BCDE
210 MO=256*PEEK(835)+PEEK(834)
    :BE=PEEK(836)'HXEG
220 MO=MO/10'CGWA
230 PRINT B$"[DOWN,SPACE5]
    "CHR$(34)"...SHUFFLE.....SHUFFLE.
    .."CHR$(34)'DKSJ
240 GOSUB 870:REM SHUFFLE'CLCE
250 GOTO 280'BDJC
260 "[SPACE2]DEAL THE HAND,
     4 CARDS"'AABH
270 " [CMDR U24]"'AATU
280 IF SB<>0 THEN 310'EGNH
290 IF QA=2 THEN 1960'DHTI
300 REM RESET FOR NEXT HAND'BQHC
310 FB=0:SB=0:SM=0:SR=0:DBJ=0:E=0:F=0
    :G=0:H=0:IF DO=1 THEN BE=BE/2'OQRR
320 J=0:K=0:L=0:M=0:N=0:P=0:DO=0:QQ=0
    :QA=0:IF MO=>6000 THEN 2140'NPBR
330 IF I>34 THEN 90'DFBC
340 PRINT A$"[DOWN7]"D$'BEUC
350 G$=STR$(MO):PRINT B$"[DOWN]
    YOU HAVE $"G$",PLACE YOUR BET
    [SPACE2]"BE'DNWN
360 PRINT TAB(26+LEN(G$))
    :INPUT"[UP]";BE'FLJJ
370 GOTO 2040'BEDF
380 PRINT"[CLEAR]"A$"[DOWN7]
    YOU HOLD $"SH", YOUR BET IS
    $"BE'BGQO
390 REM PLAYER FIRST CARD'BPDK
400 T=0:PRINT A$;:GOSUB 970:GOSUB 1120
    :A=NU:GOSUB 1200'GYTG
410 REM NOW GET DEALER FIRST CARD'BVCF
420 GOSUB 1090:PRINT"[HOME,DOWN]";
    :GOSUB 970:GOSUB 1120;:GOSUB 1200
    :B=NU:GOSUB 1090'HFLK
430 T=6:PRINT"[HOME]"A$;:GOSUB 970
    :GOSUB 1120:GOSUB 1200:C=NU
    :QQ=C%(I)'HHJM
440 REM NOW DEALER DOWN CARD'BREH
450 GOSUB 1090:PRINT"[HOME,DOWN]";
    :GOSUB 970:GOSUB 1120:D=NU
    :ZZ=C%(I):GOSUB 1090'HHDO
460 GOTO 490'BDMF
470 "[SPACE2]CHECK DEALER FOR
    BLACKJACK"'AAFM
480 " [CMDR U28]"'AAQB
490 IF B=1 THEN GOSUB 1620
    :REM DEALER      HAS AN ACE
    SHOWING'FDRR
500 IF B=1 AND D>9 THEN DBJ=1'GIFE
510 IF D=1 AND B>9 THEN DBJ=1'GIFF
520 GOTO 550'BDJC
530 "[SPACE2]CHECK PLAYER FOR BLACK
    JACK "'AABJ
540 " [CMDR U29]"'AAVY
550 IF A=1 AND C>9 THEN 620'FHBI
560 IF C=1 AND A>9 THEN 620'FHBJ
570 GOTO 600'BDFH
580 "[SPACE2]IF ONE OR BOTH HAVE
    BLACKJACK"'AAIO
590 " [CMDR U31]"'AAJF
600 IF DBJ=0 THEN GOSUB 1090
    :GOTO 710'FMYF
610 PRINT C$"[DOWN2]DEALER BLACKJACK"
    :GOSUB 2230:GOTO 670'DLEJ
620 IF DBJ=1 THEN 660'DHDF
630 IF QA=1 THEN PRINT"[UP2,]
    BLACKJACK":GOSUB 1090:SB=1:FB=1
    :GOSUB 2310:GOTO 1790'JBRR
```

```
640 IF QA=2 THEN PRINT"[UP7,]
    BLACKJACK":SB=2:GOSUB 1090
    :GOSUB 2310:GOTO 1890'IWRU
650 PRINT"[DOWN2]PLAYER BLACKJACK"
    :GOSUB 1090:GOSUB 2310
    :GOTO 670'EOCO
660 PRINT"[DOWN2]PUSH--NO WINNERS
    !!"'BAAL
670 GOSUB 2820'BENI
680 GOTO 280:REM NEXT HAND'CMTM
690 "[SPACE2]DECISION ON HIT OR
    HOLD"'AAGP
700 " [CMDR U25]"'AAXT
710 IF QA<>0 THEN 750'EGSF
720 IF A=C OR  A>9 AND C>9 THEN PRINT
    B$"[DOWN4]DO YOU WANT TO SPLIT ?
    (S)"'IISR
730 PRINT B$"[DOWN2]YOU WANT ONE CARD
    FOR DOUBLE ? (D)"'BCVN
740 REM COME IN HERE AFTER HIT'BSVK
750 PRINT B$"[UP2]DO YOU WANT A CARD
    ? (SPACE BAR)"'BCSQ
760 PRINT B$"DO YOU HOLD ? (H)"'BCBM
770 GET W$: IF W$="" THEN 770'EIHM
780 IF W$=" "THEN 1240:REM TAKE
    CARD'EPCP
790 IF W$="H"THEN 1430:REM HOLD'ELUP
800 IF W$="D" AND T<12 AND QA=0 THEN
    GOTO 2270'IMBK
810 IF W$="S"AND A=C OR A>9 AND C>9
    AND QA=0 THEN 2190'LPLO
820 GOTO 770'BDNF
830 "[SPACE2]BEGIN ALL SUB
    ROUTINES"'AAIL
840 " [CMDR U24]"'AATX
850 "[SPACE5]SHUFFLE THE DECK"'AARL
860 "[SPACE4,CMDR U18]"'AAEV
870 DIM CK(52),C%(52)'BNYM
880 FOR I=1 TO 50:REM LAST 2 NOT
    USED'ERHR
890 R%=52*RND(0)+1'EIHP
900 IF CK(R%) <> 0 GOTO 890'EKIH
910 C%(I)=R% : CK(R%)=1'CPHI
920 NEXT'BAEF
930 REM C%(1) THRU C%(50) ARE NUMBERS
          1 THRU 52 IN RND ORDER'BRJR
940 I=0:PRINT"[CLEAR]":RETURN'DEOK
950 "[SPACE2]ADDITIONAL CARDS
    HERE"'AACN
960 " [CMDR U23]"'AAPA
970 I=I+1'CDFM
980 NUMBER=C%(I)'BLYO
990 IF NUMBER >39 THEN SUIT=4:NU=NU-39
    :GOTO 1050'HAVX
1000 IF NUMBER >26 THEN SUIT=3
     :NU=NU-26:GOTO 1050'HAME
1010 IF NUMBER >13 THEN SUIT=2
     :NU=NU-13:GOTO 1050'HADF
1020 SUIT=1:GOTO 1050:REM NU=NU'DQCA
1030 "[SPACE2]TURN NUMBER INTO CARD &
     SUIT"'AAYD
1040 " [CMDR U30]"'AAFS
1050 N$=MID$(QQ$,NU,1)'CMXC
1060 S$=MID$(VV$,SU,1):RETURN'DNNE
1070 "[SPACE2]DELAY TIMER"'AAOD
1080 " [CMDR U13]"'AAHK
1090 FOR Q=1 TO 200 :NEXT:RETURN'FHKG
1100 "[SPACE2]PUT THE CARD ON THE
     SCREEN"'AANB
1110 " [CMDR U28]"'AAQP
1120 PRINT TAB(T)"[RVS,SHFT U,SHFT *3,
     SHFT I]"'CCXB
1130 PRINT TAB(T)"[RVS,SHFT -,CMDR -,
     SPACE2,SHFT -]"'CCNB
1140 PRINT TAB(T)"[RVS,SHFT -,CMDR -]
      [SHFT -]"'CCVD
1150 PRINT TAB(T)"[RVS,SHFT -]
     [CMDR -2,SHFT -]"'CCVE
1160 PRINT TAB(T)"[RVS,SHFT -,SPACE2,
     CMDR -,SHFT -]"'CCNE
1170 PRINT TAB(T)"[RVS,SHFT J,SHFT *3,
     SHFT K]":RETURN'DDIH
1180 "[SPACE2]PUT THE NUMBERS ON
     CARDS"'AALI
1190 " [CMDR U26]"'AAIV
1200 IF N$="0"THEN N$="10"
     :PRINT TAB(T)"[UP5,RIGHT,RVS]
     "N$+S$;:PRINT Z$+S$+N$
     :RETURN'LUUK
1210 PRINT TAB(T)"[UP5,RIGHT,RVS]"N$;
     "[RVS] ";S$;:PRINT Z$;:PRINT S$;
     :PRINT"[RVS] "N$:RETURN'GVVH
1220 "[SPACE2]PLAYER WANTS A
     CARD"'AAAC
1230 " [CMDR U] "'AAIN
1240 PRINT B$"[UP2]"D$:PRINT B$+D$
     :PRINT B$"[DOWN2]"D$
     :PRINT B$"[DOWN4]"D$:PRINT'GUFI
1250 T=T+6:IF T>28 THEN T=T-1
     :IF T>35 THEN 1430'KSKK
1260 GOSUB 970:REM GET NEXT CARD'CPVG
1270 IF T=12 THEN E=NU'EGCG
1280 IF T=18 THEN F=NU'EGJH
1290 IF T=24 THEN G=NU'EGHI
1300 IF T=29 THEN H=NU'EGNA
1310 IF T=34 THEN J=NU'EGLB
1320 GOSUB 1120:GOSUB 1200
     :GOSUB 2720'DOIC
1330 TT=A+C+E+F+G+H+J'HJLG
1340 IF TT>21 THEN PRINT"[UP7]
     YOU HAVE"TT"YOU LOSE"
     :GOTO 1370'FLOO
1350 IF DO=1 THEN 1430'DHLE
1360 GOTO 750:REM BACK FOR CHOICE'CRTH
1370 IF QA<>1 THEN GOSUB 2230'FHWH
1380 IF QA=1 THEN 1790'DHTH
1390 IF QA=2 AND TA<22 THEN 1890'FLMK
1400 GOSUB 2820:GOSUB 1090
     :GOTO 280'DNUB
1410 "[SPACE2]'HOLD' CHECK PLAYERS
     POINTS"'AAKF
1420 " [CMDR U29]"'AAVU
1430 PRINT B$"[UP2]"D$:PRINT B$+D$
     :PRINT B$"[DOWN2]"D$
     :PRINT B$"[DOWN4]"D$
     :REM CLR CHOICES'GFMM
1440 GOSUB 2720:REM FACE CARDS TO
     10'S'CUBH
1450 TT=A+C+E+F+G+H+J'HJLJ
1460 A=A-(A=1)*10:GOSUB 1560
     :C=C-(C=1)*10:GOSUB 1560
     :E=E-(E=1)*10:GOSUB 1560'PQWV
1470 F=F-(F=1)*10:GOSUB 1560
     :G=G-(G=1)*10:GOSUB 1560
     :H=H-(H=1)*10:GOSUB 1560'PQIW
1480 J=J-(J=1)*10:GOSUB 1560'FNPL
1490 PRINT"[UP]YOU HAVE"TT'BCBK
1500 IF QA=1 THEN 1790'DHTB
1510 IF QA=2 THEN 1890'DHVC
1520 GOSUB 2820'BENB
1530 GOTO 2350'BEHC
1540 "[SPACE2]SUB SUB CHECK PLAYERS
     POINTS"'AAHK
1550 " [CMDR Y30]"'AAAY
1560 R=A+C+E+F+G+H+J'HIGK
1570 IF R<22 THEN SM=R'EGMJ
1580 IF SM > TT THEN TT=SM'EILL
1590 RETURN'BAQH
1600 "[SPACE2]INSURANCE"'AAPB
1610 " [CMDR U11]"'AATI
1620 IF A=1 AND C>9 THEN RETURN'GEQF
1630 IF C=1 AND A>9 THEN RETURN
     :REM IF PLAYER BJ NO INSURANCE
     OFFERED'HIBP
1640 PRINT B$"INSURANCE ? (Y/N)"'BCXI
1650 GET W$:IF W$=""THEN 1650'EJDI
1660 IF W$<>"Y"THEN PRINT B$D$:RETURN
     :REM INSURANCE REFUSED'HYZQ
1670 IF SH<BE/2 THEN PRINT B$D$"[UP]
      SORRY, NO CREDIT."'FJIQ
1675 IF SH<BE/2 THEN FOR W=1 TO 2000
     :NEXT:PRINT B$D$:RETURN'KSSV
1680 IF D>9 THEN PRINT B$D$:MO=MO+BE
     :RETURN:REM DEALER BJ GIVE NOW
     LOSE LATER'IOAW
1690 MO=MO-BE/2:PRINT B$D$"[UP]
      NO BLACKJACK, YOU LOSE
     $"BE/2'FPSV
1700 PRINT A$"[DOWN7]"D$'BEUB
1710 PRINT A$"[DOWN7]YOU HOLD
     $"SH-BE/2", YOUR BET IS $"BE'DJQL
1720 FOR W=1 TO 2000:NEXT:PRINT B$D$
     :RETURN'GNTI
1730 "[SPACE2]PLAYER SPLITS PAIR"'AADI
1740 " [CMDR U20]"'AAWS
1750 PRINT A$;:FOR Q=1 TO 6
     :PRINT TAB(6)"[SPACE5]":NEXT'HLAM
1760 PRINT A$"[UP]":GOSUB 970
     :GOSUB 1120:GOSUB 1200'EQMM
1770 T=6:C=NU:QA=1:PRINT B$"[DOWN2]
     "D$+B$"[DOWN4]"D$'FTJP
1780 GOTO 710:REM GO FOR DECISION'CRFN
1790 PRINT TAB(20)"[UP]
      FIRST HAND"'CDSO
1800 PRINT B$"[DOWN2]--- PRESS KEY
     FOR SECOND HAND ---"'BCLK
1810 TA=TT:TT=0:QA=2:E=0:F=0:G=0:H=0
     :J=0:SM=0'JGPQ
1820 GET W$:IF W$=""THEN 1820'EJCH
1830 PRINT B$:REM CLEAR FIRST HAND
     AWAY'CVEL
1840 FOR Q=1 TO 11:PRINT D$:NEXT'FICJ
1850 REM FIRST CARD,2 ED OF PAIR'BTQL
1860 T=0:PRINT A$"[UP]":NU=QQ
     :GOSUB 990:GOSUB 1120:GOSUB 1200
     :A=NU'HDBS
1870 T=6:PRINT A$"[UP]":GOSUB 970
     :GOSUB 1120:GOSUB 1200:C=NU
     :REM SECOND CARD'HJRU
1880 GOTO 710:REM GO FOR DECISION'CRFO
1890 PRINT TAB(20)"[UP]
      SECOND HAND"'CDVP
1900 GOSUB 2820'BEND
1910 IF SB=2 AND FB=1 THEN 310'FJNI
1920 IF SB=2 AND TA>21 THEN 1970'FLLJ
1930 IF SB=1 AND TT>21 THEN 310'FKSK
1940 IF TA>21 AND TT>21 THEN 280'FLXL
1950 GOTO 2350'BEHI
1960 IF SB=1 THEN 310'DGLL
1970 IF TA>21 THEN 2010'DIHM
1980 IF DT=TA THEN PRINT B$"[DOWN3]
     YOU HAVE"TA"PUSH FIRST HAND"
     :GOTO 310'FMQW
1990 IF DT>TA AND DT<22 THEN 2010'FMXR
2000 PRINT B$"[DOWN3]YOU HAVE"TA"YOU
     WIN FIRST HAND":GOSUB 2100
     :GOTO 310'DNLF
2010 PRINT B$"[DOWN3]YOU HAVE"TA"YOU
     LOSE FIRST HAND":GOSUB 2230
     :GOTO 310'DNEH
2020 "[SPACE2]MONEY"'AAEW
2030 " [CMDR U7]"'AAVC
2040 BE=ABS(INT(BE))'DIEB
2045 IF MO<=0 THEN PRINT"[CLEAR]"C$"
     [DOWN4]SORRY, YOUR BROKE.[HOME,
     DOWN3]RUN80[HOME]":END'GGLP
2050 IF BE>200 THEN PRINT"[CLEAR]
     "C$"SORRY, $200 BETTING LIMIT."
     :GOTO 340'FLML
2060 IF BE>MO THEN PRINT"[CLEAR]
     "C$"SORRY, NO CREDIT."
     :GOTO 340'FKEK
2070 SH=MO-BE:GOTO 380'DKUF
2080 "[SPACE2]WIN"'AAXD
2090 " [CMDR Y5]"'AAIG
2100 MO=MO+BE'CGBX
2110 RETURN'BAQV
2120 "[SPACE2]BREAK THE BANK"'AAMA
2130 " [CMDR Y] "'AAQJ
2140 FOR Q=1 TO 1000:GET A$:NEXT'FKWE
2150 PRINT"[CLEAR]"B$"CONGRATULATIONS
     YOU HAVE BROKE THE BANK."'BCJM
2160 PRINT TAB(11)"[DOWN]
     THIS TABLE IS CLOSED.[HOME,DOWN3]
     RUN80[HOME]":END'DEBK
2170 "[SPACE2]SPLIT TEST "'AAJF
2180 " [CMDR Y12]"'AAQL
2190 IF MO<BE*2 THEN PRINT B$"[DOWN4]
     SORRY NOT ENOUGH MONEY, NO SPLIT"
     :GOTO 770'GLTT
2200 GOTO 1750'BEKW
2210 "[SPACE2]LOSE"'AASX
2220 " [CMDR Y6]"'AALC
2230 MO=MO-BE'CGCC
2240 RETURN'BAQA
2250 "[SPACE2]DOUBLE TEST"'AAAE
2260 " [CMDR Y13]"'AATL
2270 IF MO<BE*2 THEN PRINT B$"[DOWN2]
     SORRY, NOT ENOUGH MONEY,
      NO DOUBLE.":GOTO 770'GLHS
2280 DO=1:BE=BE*2:GOTO 1240
2290 "[SPACE2]BLACKJACK"'AAPH
```

```
2300 " [CMDR Y11]"'AAIF
2310 MO=MO+BE*1.5'DJPC
2320 RETURN'BAQY
2330 "[SPACE2]PLAY DEALERS HAND"'AAXE
2340 " [CMDR U] "'AAAO
2350 GOSUB 2850'BEQD
2360 DT=B+D+K+L+M+N+P'HJCK
2370 IF DT>21 THEN PRINT C$ "[DOWN]
     DEALER HAS"DT:GOTO 2650'FNAM
2380 IF DT>16 THEN PRINT C$ "[DOWN]
     DEALER HAS"DT:GOTO 2610'FNAN
2390 B=B-(B=1)*10:GOSUB 2550
     :D=D-(D=1)*10:GOSUB 2550
     :K=K-(K=1)*10:GOSUB 2550'PQVY
2400 L=L-(L=1)*10:GOSUB 2550
     :M=M-(M=1)*10:GOSUB 2550
     :N=N-(N=1)*10:GOSUB 2550'PQMQ
2410 P=P-(P=1)*10:GOSUB 2550'FNHF
2420 IF DT>16 THEN PRINT C$ "[DOWN]
     DEALER HAS"DT:GOTO 2610'FNAI
2430 B=B+(B=11)*10:D=D+(D=11)*10
     :K=K+(K=11)*10:L=L+(L=11)*10'QOKU
2440 M=M+(M=11)*10:N=N+(N=11)*10
     :P=P+(P=11)*10'MEIQ
2450 T=T+6:IF T>28 THEN T=T-1
     : IF T>35 THEN 2610'KSLN
2460 GOSUB 970'BDTF
2470 IF T=12 THEN K=NU'EGIJ
2480 IF T=18 THEN L=NU'EGPK
2490 IF T=24 THEN M=NU'EGNL
2500 IF T=29 THEN N=NU'EGTD
2510 IF T=34 THEN P=NU'EGRE
2520 PRINT"[HOME]":GOSUB 1120
     :GOSUB 1200:GOSUB 1090:GOSUB 1090
     :GOTO 2350'GALJ
2530 "[SPACE2]SUB SUB FOR DEALERS
     HAND"'AATI
2540 " [CMDR Y26]"'AAHV
2550 U=B+D+K+L+M+N+P'HILL
2560 IF U<22 THEN SR=U'EGXJ
2570 IF SR>DT THEN DT=SR'EIPL
2580 RETURN'BAQH
2590 "[SPACE2]COMPARE SCORES"'AAQM
2600 " [CMDR U] "'AAHL
2610 IF TT>21 THEN 1960'DIOE
2620 IF SB=2 THEN 2680'DHWF
2630 IF DT=TT THEN PRINT A$TAB(12)"
     [UP2]PUSH":GOTO 280'GNWM
2640 IF DT>TT THEN PRINT A$TAB(12)"
     [UP2]YOU LOSE":GOSUB 2230
     :GOTO 280'HSGP
2650 IF TT>21 THEN 1960'DIOI
2660 IF SB=2 THEN 2000'DHIJ
2670 GOTO 2690'BEOI
2680 IF TA<21 THEN 1960'DIWL
2690 PRINT A$TAB(12)"[UP2]YOU WIN"
     :GOSUB 2100:GOTO 280'EOWR
2700 "[SPACE2]CHANGE PLAYERS FACE TO
     10'S "'AAXI
2710 " [CMDR U29]"'AAVX
2720 IF A > 9 THEN A=10'EFBG
2730 IF C > 9 THEN C=10'EFFH
2740 IF E > 9 THEN E=10'EFJI
2750 IF F > 9 THEN F=10'EFLJ
2760 IF G > 9 THEN G=10'EFNK
2770 IF H > 9 THEN H=10'EFPL
2780 IF J > 9 THEN J=10'EFTM
2790 RETURN'BAQK
2800 "[SPACE2]PRINT DEALERS FACE
     CARD"'AAFI
2810 " [CMDR U25]"'AAXV
2820 NU=ZZ:T=6:GOSUB 990
     :PRINT"[HOME,DOWN6]":GOSUB 1200
     :GOSUB 1090:RETURN'HXXO
2830 "[SPACE2]DEALERS FACES TO
     10'S"'AAUK
2840 " [CMDR U23]"'AAPW
2850 IF B>9 THEN B=10'EFDK
2860 IF D>9 THEN D=10'EFHL
2870 IF K>9 THEN K=10'EFVM
2880 IF L>9 THEN L=10'EFXN
2890 IF M>9 THEN M=10'EFAO
2900 IF N>9 THEN N=10'EFCG
2910 IF P>9 THEN P=10
2920 RETURN'BAQF
2930 "[SPACE2]INFORMATION"'AATJ
2940 " [CMDR U13]"'AAHQ
2950 POKE 53280,0:POKE 53281,0
     :PRINT CHR$(155)'EVUO
2960 PRINT"[CLEAR]"TAB(7)"[DOWN5,
     SHFT U,SHFT *23,SHFT I,LEFT,DOWN,
     SHFT -,UP]"'CCEH
2970 PRINT TAB(7)"[SHFT -,LEFT,DOWN,
     SHFT -,SPACE2,SHFT S,SHFT X,
     SHFT Z,SHFT A] BLACKJACK [SHFT S,
     SHFT X,SHFT Z,SHFT A,SPACE2,
     SHFT -,LEFT,DOWN,SHFT -,UP]"'CCOB
2980 PRINT TAB(7)"[SHFT -,LEFT,DOWN,
     SHFT J,SHFT *23,SHFT K]"'CCXI
2990 PRINT TAB(10)"[DOWN2]
     BY JERRY STURDIVANT"'CDPT
3000 PRINT TAB(5)"[DOWN3]
     DO YOU WANT INFORMATION ?
     (Y/N)"'CCCE
3010 GET Q$:IF Q$=""THEN 3010'EJIA
3020 IF Q$="Y"THEN 3040'DGVA
3030 GOTO 80'BCPX
3040 PRINT"[CLEAR,DOWN]
     RULES DIFFER AMONG CASINOS,
     THE FOLLOWINGARE THE MOST
     POPULAR"'BALQ
3050 PRINT"[DOWN]YOU CAN GO 'DOWN FOR
     DOUBLE' WITH ANY[SPACE3]
     NUMBER."'BAHM
3060 PRINT"[DOWN]YOU CAN SPLIT ANY
     PAIR. YOU CAN ONLY SPLIT ONCE.
     YOU CANNOT";'BBSR
3070 PRINT" GO DOWN FOR[SPACE5]
     DOUBLE ON A SPLIT,
      OR BLACKJACK."'BARO
3080 PRINT"[DOWN]DEALER MUST HIT 16,
      AND STAND ON 17."'BAXM
3090 PRINT"[DOWN]BLACKJACK PAYS 1.5
     TO 1."'BAJK
3100 PRINT"[DOWN]CARD COUNTING WORKS.
     AT THE END OF A HAND,
      IF THE 'DEALER' ";'BBXL
3110 PRINT"HAS LESS THAN 18[SPACE2]
     CARDS LEFT, THE DECK WILL BE
     SHUFFLED."'BAXL
3120 PRINT"[DOWN]YOU MAY WATCH A HAND
```

♣♥ BLACKJACK ♠♦

```
     BY BETTING 0."'BAWH
3130 PRINT TAB(10)"[DOWN2]
     (PRESS SPACE BAR)"'CDKF
3140 GET Q$:IF Q$=""THEN 3140'EJME
3150 PRINT"[CLEAR,DOWN]
     IF YOU WIN $5000 YOU HAVE 'BROKE
     THE TABLE' AND THE TABLE";'BBBQ
3160 PRINT" WILL CLOSE."'BAPF
3170 PRINT"[DOWN]MAXIMUM BET IS $200,
      MINIMUM IS $1."'BAGM
3180 PRINT"[DOWN]FOR EASE OF PLAYING,
      YOU CAN REPEAT YOURPREVIOUS BET
     BY ";'BBET
3190 PRINT"HITTING <RET>. OTHER-WISE,
      ENTER THE AMOUNT YOU WISH TO
     BET.[DOWN]"'BAIV
3200 PRINT"IF THE DEALER HAS AN ACE
     UP, YOU MAY BUYINSURANCE
     AGAINST";'BBGM
3210 PRINT" A DEALERS BLACKJACK
     [SPACE3]FOR 1/2 YOUR BET."'BAUI
3220 PRINT"[DOWN2]YOU HAVE $1000 TO
     START, GOOD LUCK."'BADI
3230 PRINT TAB(10)"[DOWN2]
     (PRESS SPACE BAR)"'CDKG
3240 GET Q$:IF Q$=""THEN 3240'EJNF
3250 GOTO 80'BCPC
3260 "[SPACE3]TO CHANGE THE RULES
     "'AAOI
3270 "[SPACE2,CMDR U21]"'AAIT
3280 "IF YOU WANT THE OPTION OF
     BLACKJACK ON SPLITS CHANGE"'AAWS
3290 "1780 AND 1880 TO 'GOTO
     550'"'AAML
3300 "IF YOU WANT BLACKJACK TO PAY
     DOUBLE CHANGE 2310 TO
     MO=MO+BE*2"'AALN
```

MUSICAL SPRITES

Continued from pg. 102

```
1112 DATA 8,0,0,31,8,0,0,34,8,60,0,0,
     8,65,57,33,8,0'BQSF
1114 DATA 0,35,16,64,55,36,8,62,53,0,
     8,0,57,0,8,0,55,35'BUHI
1116 DATA 8,0,53,0,8,60,52,36,8,0,54,
     38,8,0,55,40,8,59'BTTJ
1118 DATA 0,0,8,57,0,36,8,64,0,0,8,62,
     53,38,8,60,0,0'BRBL
1120 DATA 8,59,55,43,8,55,0,0,8,57,0,
     41,8,59,0,0,8,60'BSVE
1122 DATA 255,40,8,67,0,0,8,64,48,0,8,
     60,0,0,8,65,0,38'BTMG
1124 DATA 8,64,0,0,8,62,46,0,8,67,0,0,
     8,64,0,36,8,60'BRLI
1126 DATA 0,0,8,65,45,0,8,0,0,72,8,0,
     43,70,4,64,0,0'BQNK
1128 DATA 4,62,0,0,8,64,48,0,8,0,0,70,
     8,0,41,69,8,57'BRKM
1130 DATA 0,0,8,62,53,0,8,0,0,69,8,0,
     52,67,4,61,0,0'BQSF
1132 DATA 4,59,0,0,8,61,45,0,8,0,0,67,
     8,62,50,65,8,0'BRIH
1134 DATA 0,67,8,0,0,69,8,57,48,0,8,
     62,47,0,8,0,0,69'BRXJ
1136 DATA 8,59,43,67,8,0,0,65,8,55,48,
     64,8,0,0,65,8,0'BSGL
1138 DATA 0,67,8,55,46,0,16,60,45,0,8,
     64,0,255,8,65,0,0'BUFO
1140 DATA 8,59,255,43,8,55,0,0,16,60,
     52,0,16,0,50,43,16,59'BXGH
1142 DATA 0,0,8,60,48,255,8,0,50,0,8,
     0,52,36,8,0,48,0'BSXI
1144 DATA 8,62,53,0,8,0,52,0,8,0,50,
     35,8,0,55,0,8,64'BRBK
1146 DATA 48,36,8,65,0,0,8,67,0,0,8,
     59,0,38,8,60,0,40'BSPM
1148 DATA 8,55,0,0,8,58,0,0,8,0,0,36,
     8,57,0,41,8,59'BQKO
1150 DATA 50,0,8,60,52,40,8,0,48,0,8,
     0,53,38,8,0,52,0'BSUH
1152 DATA 8,59,53,0,8,0,50,0,8,60,52,
     36,8,0,53,0,8,255'BTKJ
1154 DATA 55,0,8,0,47,38,8,0,48,40,8,
     0,0,41,8,0,0,43'BRWL
1156 DATA 8,0,50,35,8,0,52,36,8,0,53,
     0,8,0,55,0,8,0'BQTN
1158 DATA 47,38,8,0,48,40,8,0,43,0,8,
     55,46,0,8,0,0,36'BSJP
1160 DATA 8,53,45,41,8,0,47,43,8,52,
     48,45,8,0,0,40,16,50'BVHJ
1162 DATA 0,41,16,0,47,43,8,52,48,36,
     8,53,50,0,8,55,52,0'BVDL
1164 DATA 8,0,43,40,19,53,45,38,24,50,
     47,43,50,52,43,24,1,255'BBYO
1166 DATA 255,255,0'BJQI
```

GLITCH FIX

Our Users' Most Asked Questions
by Linda Lee
October/November

On page 16 of this article is a reference to Figure 1, although Figure 1 does not appear. We removed that figure, which was a short chart, because the explanation of calculating CHR$ values seemed sufficient in itself—but failed to remove the text reference. In addition, the program on page 12 of the article contained a small error. In line 60030, the number 36 should be 96.

Fred D'Ignazio: Joyful Computerist
by Betsy Byrne
October/November

Photo credits for this article go to Eddie Johnson. Eddie was also the photographer for Betsy's "Kids, Commodores and Robots" article in our August/September issue.

Shutterbug
by C.D. Lane
June/July 1984

Although the program listing is correct, spaces were added between BASIC keywords to make them more readable. On some lines, these added spaces exceeded the 80-character line limit for the Commodore 64, and on the unexpanded VIC 20 it may have caused the program to run out of memory. Therefore, if you had a problem entering this program, simply go back and delete the additional spaces.

Appointment Calendar
by Dennis Bloomfield
October/November

With great embarassment we have to admit that in a flurry of page cutting we entirely removed the program listing for this article. It follows below.

Appointment Calendar: Commodore 64

```
10 GOSUB 1000
25 PRINT SC$;"[RIGHT6]APPOINTMENT
   CALENDAR":PRINT"[DOWN2,RIGHT6]
   BY DENNIS BLOOMFIELD"
30 FOR DE=1 TO 2500:NEXT
120 PRINT SC$;"[RIGHT5]
    ENTER STARTING DATE:[DOWN]"
121 PRINT"[SPACE5](ALWAYS START WITH
    SUNDAY)"
122 INPUT"[DOWN,RIGHT5][MONTH,DATE]";
    M0$,SD
125 IF LEN(M0$)>=3 AND SD<=31 THEN 180
130 PRINT SC$;"[YELLOW]
     THE MONTH NAME MUST BE AT LEAST
    ";
135 PRINT"THREE[SPACE3]
    LETTERS IN LENGTH.";
    :PRINT"[SPACE2]THE STARTING DATE"
140 PRINT" MUST BE LESS THEN 32."
    :FOR DE=1 TO 2000:NEXT
145 PRINT R$
150 FOR DE=1 TO 2000:NEXT:GOTO 120
180 CH$=LEFT$(M0$,3):IF CH$="FEB"THEN
    GOSUB 940
182 FOR X=1 TO 36 STEP 3
    :IF CH$<>MID$(M4$,X,3)THEN NEXT
183 IF CH$=MID$(M4$,X,3)THEN 190
185 PRINT SC$;"[RIGHT3,YELLOW]
    WHAT KIND OF MONTH IS THAT?"
    :FOR DE=1 TO 1200:NEXT
187 PRINT R$;:FOR DE=1 TO 1200:NEXT
    :GOTO 120
190 GOSUB 405:ED=SD+6
200 IF ED>ML THEN GOSUB 500:GOTO 220
210 M5$=CH$
220 PRINT"[CLEAR]":GOSUB 550:OPEN 1,4
225 PRINT#1,CHR$(14);"[SPACE4]WEEK OF
    : "+CH$;SD;"TO "+M5$;ED;CHR$(15)
230 PRINT#1,A$;
235 FOR X=1 TO 7:PRINT#1,B$+D$;:NEXT
240 PRINT#1,B$+C$
245 FOR X=0 TO 7:READ Z$
    :PRINT#1,E$+Z$+F$;:NEXT
250 PRINT#1,G$:GOSUB 600
260 FLAG=0:FOR X=0 TO 24:READ HR$
270 PRINT#1,G$+" "+HR$+" ";
275 FOR S=0 TO 6:PRINT#1,G$+"[SPACE7]
    ";:NEXT
280 PRINT#1,G$
282 IF HR$=" 8:00"THEN FLAG=FLAG+1
    :IF FLAG=2 THEN 290
285 GOSUB 600
290 NEXT
300 PRINT#1,K$;
310 FOR X=1 TO 7:PRINT#1,B$+M$;:NEXT
320 PRINT#1,B$+L$
350 FOR X=1 TO 5:PRINT#1,CHR$(10):NEXT
360 PRINT#1:CLOSE 1
370 PRINT SC$;"[SPACE10]PRINT AGAIN?
    [SPACE2](Y/N)[SPACE5]"
    :FOR DE=1 TO 200:NEXT
    :PRINT"[CLEAR]"
374 FOR DE=1 TO 200:NEXT
375 GET N$
376 IF N$="Y"THEN N$="":GOTO 385
380 IF N$="N"THEN N$="":GOTO 399
384 GOTO 370
385 PRINT SC$;"[RIGHT4]
    YOUR OPTIONS ARE:"
387 PRINT"[DOWN2,RIGHT6]
    1. REPRINT WITH SAME DATES."
389 PRINT"[DOWN2,RIGHT6]
    2. CHANGE DATES.":PRINT"[DOWN2,
```

Continued on pg. 120

```
    RIGHT6]3. END."
390 GET N$:IF N$=""THEN 390
395 IF N$="1"THEN RESTORE:N$=""
    :GOTO 220
396 IF N$="2"THEN RESTORE:N$="":ML=0
    :SD=0:ED=0:GOTO 120
397 IF N$="3"THEN 399
398 GOTO 390
399 PRINT"[CLEAR]":END
405 IF CH$=M1$THEN ML=LY:RETURN
410 FOR X=1 TO 13 STEP 3
420 IF MID$(M2$,X,3)=CH$THEN ML=30
    :RETURN
430 NEXT
440 FOR X=1 TO 22 STEP 3
450 IF MID$(M3$,X,3)=CH$THEN ML=31
    :RETURN
460 NEXT:RETURN
500 ED=6-(ML-SD)
510 FOR X=1 TO 40 STEP 3
520 IF MID$(M4$,X,3)=CH$THEN
    M5$=MID$(M4$,X+3,3):RETURN
530 NEXT:RETURN
550 PRINT SC$;"[SPACE12,YELLOW,RVS]
    CHECK PRINTER"
555 PRINT"[SPACE12,RVS,SPACE3]OK? (Y)
    [SPACE3,RVOFF,WHITE]"
560 GET N$:IF N$<>"Y"THEN 560
570 PRINT"[CLEAR]":N$="":RETURN
600 PRINT#1,H$;:FOR R=0 TO 6
    :PRINT#1,B$+J$;:NEXT:PRINT#1,B$+I$
    :RETURN
900 DATA"HR.","SUN","MON","TUE","WED",
    "THU","FRI","SAT"
910 DATA" 8:00"," 8:30"," 9:00"," 9
    :30","10:00","10:30","11:00","11
    :30"," NOON"
920 DATA"12:30"," 1:00"," 1:30"," 2
    :00"," 2:30"," 3:00"," 3:30"," 4
    :00"," 4:30"
930 DATA" 5:00"," 5:30"," 6:00"," 6
    :30"," 7:00"," 7:30"," 8:00"
940 PRINT SC$;:INPUT"[RIGHT5]
    IS IT LEAP YEAR (Y/N)";N$
945 IF N$="Y"THEN LY=29:N$="":GOTO 955
950 N$="":LY=28
955 FOR DE=1 TO 450:NEXT:RETURN
1000 SC$="[CLEAR,WHITE,DOWN7]"
1020 A$="[CMDR A]":B$="[SHFT *7]"
     :C$="[CMDR S]":D$="[CMDR R]"
     :E$="[SHFT -,SPACE2]"
     :F$="[SPACE2]":G$="[SHFT -]"
     :H$="[CMDR Q]"
1030 I$="[CMDR W]":J$="[SHFT +]"
     :K$="[CMDR Z]":L$="[CMDR X]"
     :M$="[CMDR E]"
1050 M0$="":M1$="FEB":M2$="APRJUNSEPN
     OV":M3$="JANMARMAYJULAUGOCTDEC"
1070 R$="[DOWN2,RIGHT5]
     PLEASE ENTER DATA AGAIN[WHITE]"
1080 M4$="JANFEBMARAPRMAYJUNJULAUGSEP
     OCTNOVDECJAN"
1090 RETURN
```

Appointment Calendar: VIC 20

```
10 GOSUB 1000
25 PRINT SC$;"[BLACK,RIGHT]
   APPOINTMENT CALENDAR"
   :PRINT"[DOWN2,RIGHT]
   BY DENNIS BLOOMFIELD"
30 FOR DE=1 TO 2500:NEXT
120 PRINT SC$;"ENTER STARTING DATE
    :[DOWN]"
121 PRINT"(ALWAYS START WITH A[SPACE3]
    SUNDAY)"
122 INPUT"[DOWN][MONTH,DATE]";M0$,SD
125 IF LEN(M0$)>=3 AND SD<=31 THEN 180
130 PRINT SC$;"[RED]THE MONTH NAME
    MUST BEAT LEAST ";
135 PRINT"THREE LETTERSIN LENGTH.";
    :PRINT" STARTING[SPACE3]DATE";
140 PRINT" MUST BE LESS THEN32."
    :FOR DE=1 TO 2000:NEXT
145 PRINT R$
150 FOR DE=1 TO 2000:NEXT:GOTO 120
180 CH$=LEFT$(M0$,3):IF CH$="FEB"THEN
    GOSUB 940
182 FOR X=1 TO 36 STEP 3
    :IF CH$<>MID$(M4$,X,3)THEN NEXT
183 IF CH$=MID$(M4$,X,3)THEN 190
185 PRINT SC$;"[RED,RVS]
    WHAT KIND OF MONTH IS[SPACE10]
    THAT?[SPACE8]":FOR DE=1 TO 1200
    :NEXT
187 PRINT R$;:FOR DE=1 TO 1200:NEXT
    :GOTO 120
190 GOSUB 405:ED=SD+6
200 IF ED>ML THEN GOSUB 500:GOTO 220
210 M5$=CH$
220 PRINT"[CLEAR]":GOSUB 550:OPEN 1,4
225 PRINT#1,CHR$(14);"[SPACE4]WEEK OF
    : "+CH$;SD;"TO "+M5$;ED;CHR$(15)
230 PRINT#1,A$;
235 FOR X=1 TO 7:PRINT#1,B$+D$;:NEXT
240 PRINT#1,B$+C$
245 FOR X=0 TO 7:READ Z$
    :PRINT#1,E$+Z$+F$;:NEXT
250 PRINT#1,G$:GOSUB 600
260 FLAG=0:FOR X=0 TO 24:READ HR$
270 PRINT#1,G$+" "+HR$+" ";
275 FOR S=0 TO 6:PRINT#1,G$+"[SPACE7]
    ";:NEXT
280 PRINT#1,G$
282 IF HR$=" 8:00"THEN FLAG=FLAG+1
    :IF FLAG=2 THEN 290
285 GOSUB 600
290 NEXT
300 PRINT#1,K$;
```

USER GROUPS

Because our user group listing has become excessively long, we are now publishing only a partial list in each issue. This time we've included all our user groups in states beginning with letters A through M. Next issue we'll publish all the groups in states beginning with letters N through W and all foreign groups. Then the following issue, it's back to A through M, and so on, until we get so many that we have to publish in three—or four—or more—parts.

ALABAMA

Riverchase Commodore Users Group
617 Grove St.
Birmingham, AL 35209
Ken Browning
(205) 988-1078

The Birmingham Commodore Computer Club
4845 Avenue 'V'
Birmingham, AL 35208
Harry Jones
(205) 923-9260

Wiregrass Micro-Computer Society
Commodore SIG
109 Key Bend Rd.
Enterprise, AL 36330
Bill Brown
(205) 347-7564

Huntsville PET Users Club
9002 Berclair Rd.
Huntsville, AL 35802
every 2nd Thursday
Hal Carey

1920-A Avenue C
Brookly
Mobile, AL 36615
Howard Crider
(205) 661-1973

Commodore Club of Mobile
3868-H Rue Maison
Mobile, AL 36608
3rd Thurs. of month
Tom Wyatt
(205) 343-1178

Shoals Commodore Users Group (SCUG)
209 Lakeshore Dr.
Muscle Shoals, AL 35661
2nd & 4th Tues. of month
Geo. Taylor

Tiger Byte
c/o The Computer Store
Midway Plaza
Opelika, AL 36801
1st & 3rd Wed. of month
Jack Parsons

CC & Me
P.O. Box 324
Pinson, AL 35126
Bill Freeman
(205) 854-0650

1734 S. Atmore Ave.
Whistler, AL 36612
William Autry
(205) 452-9740

ALASKA

Alaska 84 Computer Club
c/o Line 49 Management
P.O. Box 6043
Anchorage, AK 99502

First City Users Group
P.O. Box 6692
Ketchikan, AK 99901
James Llanos
(907) 225-5695

COMPOOH-T
c/o Box 118
Old Harbor, AK 99643
(907) 286-2213

ARIZONA

Arizona VIC & 64 Users
904 W. Marlboro Circle
Chandler, AZ 85224
Tom Monson
(602) 963-6149

Central Arizona PET People
842 W. Calle del Norte
Chandler, AZ 85224
Roy Schaher
(602) 899-3622

Canyon De Chelly—Four Corners Users Group
c/o Calumet Consulting
Box 1945
Chinle, AZ 86503
Larry DiLucchio
(602) 674-3421

Gila Hackers
Rt. #1
Globe, AZ 85501
Paul R. Machula
(602) 425-7260

Arizona VIC 20-64 Users Club
232 W. 9th Place North
Mesa, AZ 85201
Donald Kipp

VIC Users Group
2612 E. Covina
Mesa, AZ 85203
Paul Muffuletto

West Mesa VIC
2351 S. Standage
Mesa, AZ 85202
Kenneth Epstein

Catalina Commodore Computer Club
2012 Avenida Guillermo
Tucson, AZ 85710
7 p.m.
George Pope
(602) 296-6766

ARKANSAS

Commodore/PET Users Club
Conway Middle School
Davis St.
Conway, AR 72032
Geneva Bowlin

Commodore Computer Club of Ft. Smith
P.O. Box 6000
So. Station
Ft. Smith, AR 72906
2nd Tues. of month
Joe Ragsdale

P.I.C. Club
c/o Hatfield Public Schools
Box 130
Hatfield, AR 71945
Bob Reed
(501) 389-6164

River City Commodore Club
P.O. Box 4298
North Little Rock, AR 72116
Gary Smith

Arkansas River Valley Commodore Users
401 S. Arlington Dr.
Russellville, AR 72801
Bob Brazeal
(501) 967-1868

The Siloam Commodore Computer Club
P.O. Box 88
Siloam Springs, AR 72761
Ken Emanualson
(501) 524-5624

CALIFORNIA

CA. Area Commodore Terminal Users Society
C.A.C.T.U.S.
P.O. Box 1277
Alta Loma, CA 91701
Darrell Hall

Humboldt Commodore Group
c/o R. Turner
P.O. Box 570
Arcata, CA 95521
R. Turner

VIC 20 Software Exchange
7660 Western Ave.
Buena Park, CA 90620
Vincent Beltz

The Valley Computer Club
2006 Magnolia Blvd.
Burbank, CA 91506
1st Wed. 7 p.m.

San Fernando Valley Commodore Users Group
21208 Nashville
Chatsworth, CA 91311
2nd Wed. 7
Tom Lynch
(213) 709-4736

NVCUG
P.O. Box 1925
Chico, CA 95927
Jim Banks
(916) 343-4611

Amateurs and Artesians Computing
P.O. Box 682
Cobb, CA 95426

Diablo Valley Commodore Users Group
P.O. Box 27155
Concord, CA 94520
(415) 838-2838

Commodore Tech. Users Group C-TUG
P.O. Box 1497
Costa Mesa, CA 92626

Commodore 64 West
P.O. Box 346
Culver City, CA 90232
Charles P. Santos
(213) 398-0913

PUG of Silicon Valley
22355 Rancho Ventura Rd.
Cupertino, CA 95014

Valley Computer Club
P.O. Box 310
Denair, CA 95316

California VIC Users Group
c/o Data Equipment Supply Corp.
8315 Firestone Blvd.
Downey, CA 90241
2nd Tuesday of month
(213) 932-9361

Southern California PET Users Group
c/o Data Equipment Supply Corp.
8315 Firestone Blvd.
Downey, CA 90241
First Tuesday of month
(213) 923-9361

Sixty Fourum
P.O. Box 16098
Fresno, CA 93755
John Damiano

VIC 20 Software Exchange Club
10530 Sky Circle
Grass Valley, CA 95945
Daniel Upton

The Diamond Bar R.O.P. Users Group
2644 Amelgado
Hacienda Hgts., CA 91745
Don McIntosh
(213) 333-2645

C-64 West Orange County Users Group
P.O. Box 1457
Huntington Beach, CA 92647
2nd & 4th Tues. of month
Philip Putman
(714) 842-4484

SPHINX
267 Arlington Ave.
Kensington, CA 94707
Bill MacCracken
(415) 527-9286

Antelope Valley Commodore Users Group
POB 4436
Lancaster, CA 93539
1st Saturday
James Haner
(805) 942-2626

PALS (Pets Around Livermore Society)
886 South K
Livermore, CA 94550
John Rambo

The Exchange
P.O. Box 9189
Long Beach, CA 90810
Michael C. Joseph
(213) 595-1771

San Luis Obispo Commodore Computer Club
1766 9th St.
Los Osos, CA 93402
BBS - (805) 528-7475
Joan Rinehart
(805) 528-3371

South Bay Commodore Users Group
401 - 9th St.
Manhatten Beach, CA 90266
Lloyd Lehrer
(213) 374-1247

Lincoln Computer Club
750 E. Yosemite
Manteca, CA 95336
John Fung

Manteca VIC 20 Users Organization
429 N. Main St.
Manteca, CA 95336
Gene Rong

Napa Valley Commodore Computer Club
c/o Liberty Computerware
2680 Jefferson St.
Napa, CA 94558
ngt. ph. (707) 944-2797
1st&3rd Mon. of month
Mick Winter
(707) 252-6281

Sacramento Commodore Users Group
8120 Sundance Dr.
Orangevale, CA 95662
Robyn Graves
(916) 969-2028

C-64/VIC 20 Users Group
Pasadena City College
Cicadian Room
Pasadena, CA
7p.m. 1st & 3rd Thursdays
Chuck Cypher
(714) 593-4880

SIG (Special Interest Group)
1135 Coronet Ave.
Pasadena, CA 91107
Brian R. Klotz

Commodore Owners of Petaluma (COOP)
877 Grant Ave.
Petaluma, CA 94952
4th Wed.@ La Tercera School
Dave Stroud
(707) 762-8398

Pomona Valley VIC Users Group
1401 W. 9th
Pomona, CA 91766
1st & 3rd Wed. of month 7pm
Mark Joerger
(714) 620-8889

Commodore Users Group of Riverside (CUGR)
P.O. Box 8748
Riverside, CA 92515
2nd & 4th Thurs. @ night
Ken Brown
(714) 689-1452

Jurupa Wizards
8700 Galena St.
Riverside, CA 92509
Walter J. Scott
781-1731

Southern California Edison Commodore Club
P.O. Box 800
Rosemead, CA 91770
Jerry Van Norton

Computer Barn Computer Club
319 Main St.
Suite #2
Salinas, CA 93901
S. Mark Vanderbilt
757-0788

Peninsula Commodore Users Group
549 Old County Rd.
San Carlos, CA 94070
2nd Thurs. of month
Timothy Very
(415) 593-7697

S.D. East County C-64 User Group
c/o Linda Schwartz
6353 Lake Apopka Place
San Diego, CA 92119
Linda Schwartz
(619) 698-7814

San Diego Commodore (PET) User Group
Box 86531
San Diego, CA 92138
3rd Thurs. of month 7-10p.m.
Jane Campbell
(619) 277-7214

PET on the Air
525 Crestlake Dr.
San Francisco, CA 94132
Max J. Babin

San Francisco Commodore Users Group
278 - 27th Ave. #103
San Francisco, CA 94121
Roger Tierce
(415) 387-0225

Visions - 64
P.O. Box 26638
San Francisco, CA 94126
David Lee

VIC-Club
1503A Dolores
San Francisco, CA 94110
ages 10 to 16 preferred.
Colin Johnston

20/64 Users Group
P.O. Box 18473
San Jose, CA 95158
1st Sunday
Don Cracraft

LOGIKS Commodore Computer Club
c/o Christ Presbyterian Church
620 Del Ganado Rd.
San Rafael, CA 94903
2nd Wed. of month @ 7
Elmer Johnson
(415) 479-0426

Marin Commodore Computer Club
620 Del Ganado Rd.
San Rafael, CA
2nd Wed. of month 7
(415) 479-0426

South Bay Commodore 64 Users Group
P.O. Box 3193
San Ysidro, CA 95073

SBCUG
4520 Via Vistosa
Santa Barbara, CA 93110
Walter Hausz
(805) 967-3877

The Commodore Connection
2301 Mission St.
Santa Cruz, CA 95060
Bud Massey
(408) 425-8054

Commodore Users Group
4237 Plumeria Ct.
Santa Maria, CA 93455
Gilbert Vela
(805) 937-4174

USER GROUPS

Commodore 64 West Computer Club
2917 Colorado Ave.
Santa Monica, CA 90404
Don Campbell
(213) 828-9308

Santa Rosa Commodore 64 Users Group
333 East Robles Ave.
Santa Rosa, CA 95407
meets once a month
Garry Palmer
(707) 584-7009

Suisun/FF/Vacaville Commodore Users Group
1410 Pelican Way
Suisun City, CA 94585
Charles D. Akula
(707) 426-2077

Commodore Interest Association
c/o Computer Data
14660 La Paz Dr.
Victorville, CA 92392
Mark Finley

Bay Area Home Computer Asso.
1332 Pine St.
Walnut Creek, CA 94598
Cliff Downing
(415) 932-5447

Walnut Creek PET Users Club
1815 Ygnacio Valley Rd.
Walnut Creek, CA 94596

COLORADO

Commodore Users Group
Box 377
Aspen, CO 81612
1st Monday in the evenings.
Ray Brooks
(303) 925-5604

Aurora Market Users Group
c/o Computer Market Place
15200 E. 6th Ave
Aurora, CO 80012
Roger Oberdier
(303) 367-0901

Colorado Springs Computer Society (CSCS)
Qtrs. 5938-A
Colorado Springs, CO 80913
Michael Brazonis
(303) 576-4219

Colorado Commodore Computer Club
2187 S. Golden Ct.
Denver, CO 80227
Jack Moss at 986-0577

VICKIMPET Users Group
4 Waring Lane
Littleton, CO 80121
Louis Roehrs

Vicdore Users Group
326 Emery Dr.
Longmont, CO 80501
Wayne Sundstrom
(303) 772-2821

CONNECTICUT

Fairfield County Commodore Users Group
P.O. Box 212
Danbury, CT 06810
Linda Retter

The Commodore East Users Group
165 B S. Bigelow Rd.
Hampton, CT 06247
(203) 455-0108

CT Computer Society
180 Bloomfield Ave.
Hartford, CT 06105
last Sat. of month
Harry Hill
(203) 233-3373

Skiff Lane Masons Island
Mystic, CT 06355
John F. Garbarino
(203) 536-9789

New London County Commodore Club
Doolittle Road
Preston, CT 06360
Dr. Walter Doolittle

Commodore Users Group of Stratford
P.O. Box 1213
Stratford, CT 06497
Dan Kern-Ekins
(203) 377-8373

Capitol Region Commodore Computer Club
57 Carter Dr.
Tolland, CT 06084
2nd Mon. of month @ 7 p.m.
Prudence Schifley

VIC Users Club
22 Tunxis Rd.
West Hartford, CT 06107
Edward Barszczewski

Commodore Users Group
Wethersfield High School
411 Wolcott Hill Rd.
Wethersfield, CT 06109
Daniel G. Spaneas

DELAWARE

The Diamond State Users Group
Box 892
Felton, DE 19943
Michael Butler
(302) 284-4495

Newark Commodore Users Group (NCUG)
210 Durso Dr.
Newark, DE 19711
once a month @ Newark H.S.
Bob Black
(302) 737-4686

Brandywine Users Group
P.O. Box 10943
Wilmington, DE 19850
Rick Jeandell
(302) 362-6162

DISTRICT OF COLUMBIA

USO Computer Club
USO Outreach Center
207 Beyer Rd.
Washington, DC 20332
Steven Guenther

FLORIDA

Brandon Commodore Users Group
414 E. Lumsden Rd.
Brandon, FL 33511

Brandon Users Group
108 Anglewood Dr.
Brandon, FL 33511
Paul Daugherty
(813) 685-5138

Clearwater Commodore Club
1532 Lemon St.
Clearwater, FL 33516
Gary Gould
(813) 442-0770

El Shift OH
P.O. Box 548
Cocoa, FL 32922
Sat.mornings/every4to6weeks
Mike Schnoke

Volusia Ct. Commodore Program Exchange
1612 Reynolds Rd.
DeLeon Springs, FL 32028
Rick Stidham

Ram Rom 84
1620 Morning Dove Lane
Englewood, FL 33533
Nancy Kenneally
(813) 474-9450

Gainesville Commodore Users Group
Santa Fe Community College
Gainesville, FL 32602
James E. Birdsell

Gulf Coast Computer Club
c/o St. Petersburg Times Bldg.
Hudson, FL 33567
2nd & 4th Thursdays
847-5049

Sun Coast VICs
P.O. Box 1042
Indian Rocks Beach, FL 33535
Mark Weddell

Commodore Computer Club
P.O. Box 9726
Jacksonville, FL 32208
2nd & 4th Tues. of month
David Phillips
(904) 764-5457

Jacksonville Area PET Society
401 Monument Rd. #177
Jacksonville, FL 32211

VIC/64 Heartland Users Group
1220 Bartow Rd. #23
Lakeland, FL 33801
4th Wed of month at PRC
Tom Keough
(813) 666-2132

South Tampa Commodore 64 Users Group
736 F Second Dr.
Macdill AFB, FL 33621
Ronald S. Clement

6278 SW 14th St.
Miami, FL 33144
Richard Prestien

64 Educators Users Group South
FDLRS-South
9220 S.W. 52nd Terrace
Miami, FL 33165
Dr. Eydie Sloane
(305) 274-3501

Miami 20/64
12911 S.W. 49th St.
Miami, FL 33175
(305) 226-1185

PETs and Friends
129 NE 44th St.
Miami, FL 33137
Richard Plummer

The Ultimate 64 Experiance
5740 S.W. 56th Terrace
Miami, FL 33143
Sandy Cueto

Lakeland VIC 20 Users Group
2450 Shady Acres Dr.
Mulberry, FL 33860

64 Educators Users Group North
16330 N.E. 2nd Ave.
North Miami Beach, FL 33162
Robert Figueroa
(305) 944-5548

Commodore 64/VIC 20 User Group
Martin Marietta Aerospace
P.O. Box 5837
Orlando, FL 32855
Mr. Earl Preston (305)
352-3252/2266

VIC Users Club
4071 Edgewater Dr.
Orlando, FL 32804
Ray Thigpen

Suncoast 64s
c/o Little Professor Book Center
2395 U.S. 19 North
Palm Harbor, FL 33563
Curtis Miller
(813) 785-1036

Bay Commodore Users Group
c/o Gulf Coast Computer Exchange
241 N. Tyndall Pkwy.
Panama City, FL 32401
Richard Scofield
(904) 785-6441

The Commodore Advantage
P.O. Box 18490
Pensacola, FL 32523
2nd Friday of month
Deanna Owens
(904) 456-6554

Charlotte County Commodore Club (CCCC)
567 N. Ellicott Circle
Port Charlotte, FL 33952
Lee Truax
(813) 625-1277

Sanibel Commodore Users Group (SCUG)
1119 Periwinkle
Box 73
Sanibel, FL 33957
Phil Belanger
(813) 472-3471

Commodore Computer Club
P.O. Box 21138
St. Petersburg, FL 33742
Chuck Fechko
(813) 522-2547

The Class of 64
c/o The Computer Corner
5208 - 66th St.
St. Petersburg, FL 33709
Joe Spatafora
(813) 541-1185

Commodore Users Group
545 E. Park Ave.
Apt. #2
Tallahassee, FL 32301
Jim Neill
(904) 224-6286

Broward Commodore Users Group
13 Spinning Wheel Lane
Tamarac, FL 33319
Lewis Horn
(305) 726-4390

Tampa Bay Commodore Computer Club
10208 N. 30th St.
Tampa, FL 33612
(813) 977-0877

Tampa Commodore Users Group
P.O. Box 8713
Tampa, FL 33674
(813) 237-2100

South Florida PET Users Group
7170 S.W. 11th St.
West Hollywood, FL 33023
Dave Young
(305) 987-6982

Commodore Connection
P.O. Box 6684
West Palm Beach, FL 33405

GEORGIA

Albany Commodore Amateur Computerist
P.O. Box 5461
Albany, GA 31706
David Via

Atlanta 64 Users Group
P.O. Box 5322
Atlanta, GA 30307
Phil J. Autrey

VIC-tims
P.O. Box 467052
Atlanta, GA 30346
Eric Ellison
(404) 922-7088

VIC Educators Users Group
Cherokee County Schools
110 Academy St.
Canton, GA 30114
Dr. Al Evans

Golden Isles Commodore Users Club
Bldg. 68
Glynco, GA 31524
Richard L. Young

Commodore Club of Agusta
929 N. Willow Wick Dr.
Grovetown, GA 30813
David Dumas

Atlanta Commodore 64 Users Group
1767 Big Valley Lane
Stone Mountain, GA 30083
Ron Lisoski
(404) 981-4253

HAWAII

Commodore Users Group of Honolulu
c/o PSH
824 Bannister St.
Honolulu, HI
MEETS at Kaliho Librar
3rd Fri.every month
(808) 848-2088

Commodore Users Group of Honolulu
1626 Wilder #701
Honolulu, HI 96822
Jay Calvin (808) 944-9380
(808) 848-2088

20/64 Hawaii
P.O. Box 966
Kailua, HI 96734
Wes Goodpaster

IDAHO

64-B.U.G. (Boise Users Group)
403 Thatcher St.
Boise, ID 83702
Rick Ohnsman
(208) 384-1423

GHS Computer Club
c/o Grangeville High School
910 S. D St.
Grangeville, ID 83530
Don Kissinger

Eagle Rock Commodore Users Group
900 S. Emerson
Idaho Falls, ID 83401
Nancy J. Picker

Commodore Users Group
310 Emerald Dr.
Kellogg, ID 83837
Grant Bewick
(208) 784-8751

Pocatello Commodore Users Group
1250 E. Benton
Pocatello, ID 83201
Richard Harker
(208) 232-1607

S.R.H.S. Computer Club
c/o Salmon River High School
Riggins, ID 83549
Barney Foster

U.G.L.I.-User Groups of Lower Idaho
Rt 4
Rupert, ID 83350
Sean Brixey

ILLINOIS

Commodore 64 Users Club
104 Susan Lane
Carterville, IL 62918
Doyne Horsley
(618) 985-4710

Champaign-Urbana Commodore Users Group
2006 Crescent Dr.
Champaign, IL 61821
Steve Gast
(217) 352-9681

2731 N. Milwaukee Ave.
Chicago, IL 60647
Shelly Wernikoff

Chicago Commodore 64 Users & Exchange Club
P.O. Box 14233
Chicago, IL 60614
Jim Robinson

Commodore SIG Cache
Box C-176
323 S. Franklin
Chicago, IL 60606
3rs Sun. of month 11am-1pm
Herb Swanson
(312) 685-0994

McHenry County Commodore Club
227 East Terra Cotta Ave.
Crystal Lake, IL 60014
2nd Sat. at C. Lake Ambutal
John Katkus
(815) 455-3942

PAPUG - Peoria Area PET Users Group
6 Apple Tree Lane
East Peoria, IL 61611
2nd Fri. of month
Max Taylor
(309) 673-6635

COMCOE (Commodore Club of Evanston)
2108 Sherman Ave.
Evanston, IL 60201
Jim Salsbury

Fox Valley PET Users Group
833 Willow St.
Lake in the Hills, IL 60102
Art DeKneef
(312) 658-7321

The C-64 Users Group
P.O. Box 46464
Lincolnwood, IL 60646
or call Darrell(312) 588-0334
David Tamkin
(312) 583-4629

The Commodore 64 Users Group
Suite 100
4200 Commerce Court
Lisle, IL 60532
Gus Pagnotta
(312) 369-6525

Survivors of Sixty-four Users Group (SOSUG)
WESL Institute
Western Illinois University
Macomb, IL 61455
1st Wed. & 3rd Thurs.
Macey B. McKee 837-5378
(309) 298-2106

USER GROUPS

Mt. Vernon Commodore Users
Group (MVCUG)
P.O. Box 512
Mt. Vernon, IL 62864

Central Illinois PET User Group
635 Maple
Mt. Zion, IL 62549
Jim Oldfield
(217) 864-5320

PET VIC Club (PVC)
40 S. Lincoln
Mundelein, IL 60060
Paul Schmidt

Fox Valley 64 Users Group
P.O. Box 28
No. Aurora, IL 60542
1st Thurs. of month 7-10p.m
Frank Christensen
(312) 898-2779

Oak Lawn Commodore Users
Group
The Computer Store
11004 S. Cicero Ave.
Oak Lawn, IL 60453
Bob Hughes
(312) 499-1300

RAP 64/VIC Regional Asso. of
Programmers
10721 S. Lamon
Oak Lawn, IL 60453
Bob Hughes

Commodore Users Club
1707 East Main St.
Olney, IL 62450
David E. Lawless

VIC 20/64 Users Support Group
114 S. Clark St.
Pana, IL 62567
David R. Tarvin
(217) 562-4568

Illinois Valley Commodore Users
Group
2330 - 12th St.
Peru, IL 61354
Brian Foster
(815) 223-5141

WIPUG
Rt. 5
Quincy, IL 62301
Edward Mills
(217) 656-3671

ASM/TED User Group
200 S. Century
Rantoul, IL 61866
Brant Anderson
(217) 893-4577

Rockford Area PET Users Group
1608 Benton St.
Rockford, IL 61107

Springfield Area VIC Enthusiasts
(S.A.V.E)
P.O. Box 2961
Springfield, IL 62708
1st Tuesday of month
Mike Stout
(217) 522-2706

Springfield PET Users Group
(SPUG)
3116 Concord
Springfield, IL 62704
3rd Fri. each month 7pm
Bill Eardley
(217) 753-8500

The Kankakee Hackers
RR #1
St. Anne, IL 60964
Rich Westerman
(815) 933-4407

INDIANA

VIC/64 Users Group
c/o Delco Remy Div. General
Motors
2401 Columbus Ave.
Anderson, IN 46014
3rd Wed or Thurs. of month
Richard Clifton
(317) 378-3016

Commodore Computer Club
3814 Terra Trace
Evansville, IN 47711
John Patrick
(812) 477-0739

Computer Workshop VIC 20/64
Club
282 S. 600 W.
Hebron, IN 46341
Mary O'Bringer
(219) 988-4535

Cardinal Sales
6225 Coffman Rd.
Indianapolis, IN 46268
Carol Wheeler
(317) 298-9650

PET/64 Users
10136 E. 96th St.
Indianapolis, IN 46256
Jerry Brinson
(317) 842-6353

VIC Indy Club
P.O. Box 11543
Indianapolis, IN 46201
Fred Imhausen
(317) 357-6906

Commodore Users Group
1020 Michigan Ave.
Logansport, IN 46947
Mark Bender
(219) 722-5205

The National Science Clubs of
America
Commodore Users Division
P.O. Box 10621
Merrillville, IN 46411
Brian Lepley orJeff Brown

CHUG (Commodore Hardware
Users Group)
12104 Meadow Lane
Oaklandon, IN 46236
Ted Powell

East Central Indiana VIC User
Group
Rural Route # 2
Portland, IN 47371
Stephen Erwin

National VIC 20 Program Exchange
102 Hickory Court
Portland, IN 47371
Stephen Erwin
(219) 726-4202

Fulton County Commodore Users
1705-3 Madison
Rochester, IN 46975
2nd Thurs. of month
Jim Tyler
(219) 223-4430

Seymour Peekers
c/o D&L Camera Shop
108 N. Chestnut
Seymour, IN 47274
Dennis Peters

Northern Indiana Commodore
Enthusiasts
927 S. 26th St.
South Bend, IN 46615
Eric T. Bean

Western Indiana Commodore
Users Group
912 South Brown Ave.
Terre Haute, IN 47803
Dennis Graham
(812) 234-5099

Commodore Owners Of Lafayette
(COOL!)
20 Patrick Lane
West Lafayette, IN 47906
Ross Indelicato
(317) 743-3410

IOWA

Commodore Users Group
114 8th St.
Ames, IA 50010

Commo-Hawk Commodore Users
Group
P.O. Box 2724
Cedar Rapids, IA 52406
Vern Rotert

Quad City Commodore Computer
Club
P.O. Box 3994
Davenport, IA 52808
3rd Tues. of month
Mike Hoeper
(319) 242-1496

Crawford County Commodore
Users Group
519 N. 19th St.
Denison, IA 51442
Kenneth Haydon
(712) 263-6274

Commodore Computer Users
Group of Iowa
Box 3140
Des Moines, IA 50316
Laura Miller (515) 287-1378
or(515) 263-0963

Newton Commodore Users Group
320 W. 9th St.
Newton, IA 50208
1st Wed. of month
David Schmidt
(515) 792-0814

Siouxland Commodore Club
2700 Sheridan St.
Sioux City, IA 51104
1st & 3rd Monday of month
Gary Johnson
(712) 258-7903

VIC 20 & C-64 User Group
421 W. 6th St.
Waterloo, IA 50702
Frederick Volker
(319) 232-1062

KANSAS

Walnut Valley Commodore User
Group
1003 S. 2nd St.
Arkansas City, KS 67005
Bob Morris

Salt City Commodore Club
P.O. Box 2644
Hutchinson, KS 67501
Wendell Hinkson

Kansas Commodore Computer
Club
101 S. Burch
Olathe, KS 66061
Paul B. Howard

Commodore Users Group
6050 S. 183 St. West
Viola, KS 67149
Walter Lounsbery

Wichita Area PET Users Group
2231 Bullinger
Wichita, KS 67204
Mel Zandler
(316) 838-0518

KENTUCKY

C*BUG - Commodore Bardstown
User Group
P.O. Box 165
Bardstown, KY 40004
Patrick Kirtley
(502) 348-6380

The Bowling Green Commodore
Users Group
Route 11
Bowling Green, KY 42101
Alex Fitzpatrick
(502) 781-9098

Glasgow Commodore Users Group
P.O. Box 154
Glasgow, KY 42141
Steve England

VIC Connection
1010 s. Elm
Henderson, KY 42420
Jim Kemp

Louisville Users of Commodore KY.
(LUCKY)
P.O. Box 22244
Louisville, KY 40222
2nd Tues. of month
(502) 425-2847

LOUISIANA

64-Club News
5200 Corporate Blvd.
Baton Rouge, LA 70808
Tom Parsons
(504) 925-5870

Commodore 64 Users Group
P.O. Box 1422
Baton Rouge, LA 70821
3rd Tues. of month
Richard Hood

Commodore PET Users Group (C-PUG)
616 N. Niagra Circle
Gretna, LA 70053
2nd Sat. of month at 4p.m.
Stan Pape
(504) 394-4928

NOVA
917 Gordon St.
New Orleans, LA 70117
Kenneth McGruder
(504) 948-7643

Ark-La-Tex Commodore 64 Club
5615 Fairfax
Shreveport, LA 71108
every other Wed. @ 6
Bill Walker
(318) 636-3611

Commodore Users Group of
Oachita
P.O. Box 175
Swaric, LA 71281
Beckie Walker
(318) 343-8044

Franklin Parish Computer Club
#3 Fair Ave.
Winnisboro, LA 71295
James D. Mays

MAINE

COM-VICS (Commodore/VIC
Users Group)
RFD #1
Hebron, ME 04238
1st Wed. & 3rd Thurs.
Paul Lodge
(207) 966-3641

So. ME. 64
10 Walker St.
Portland, ME 04102
Ed Moore
(207) 761-1626

Compumania
81 North St.
Saco, ME 04072
Richard L. Nadeau
(207) 282-7418

Northwoods Commodore Users
Group
740 Main St.
Van Buren, ME 04785
Diane Porter

Your Commodore Users Group
Box 611
Westbrook, ME 04092
Mike Procise
(207) 854-4579

MARYLAND

The Compucats' Commodore
Computer Club
680 W. Bel Air Ave.
Aberdeen, MD 21001
Betty Jane Schueler
(301) 272-0472

VIClique (Linthicum Heights)
105A Conduit St.
Annapolis, MD 21401
M.I.T.A.G.S.
Pat Foley
(301) 263-8568

Commodore Users Group of
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P.O. Box 9726
Arnold, MD 21012
The Software Co.
(301) 974-4548
Bay-Cug - Baltimore Area
Commodore Users
4605 Vogt Ave.
Baltimore, MD 21206
Michael M. Broumberg
(301) 325-2156

Blue TUSK
700 East Joppa Rd.
Baltimore, MD 21204
Jim Hauff

House of Commodore
8835 Satyr Hill Rd.
Baltimore, MD 21234
Ernest J. Fischer

Long Lines Computer Club
323 N. Charles St.
Baltimore, MD 21201
Gene Noff

Westinghouse BWI Commodore
User Group
Attn
P.O. Box 1693
Baltimore, MD 21203

Assoc. of Personal Computer Users
5014 Rodman Rd.
Bethesda, MD 20016

VIC & 64 Users Group
The Boyds Connection
21000 Clarksburg Rd.
Boyds, MD 20841
Tom DeReggi
(301) 428-3174

Southern MD Commodore Users
Group
6800 Killarney St.
Clinton, MD 20735
1st Tues. of month @ 7
Tom Helmke
(301) 868-6536

Harford County Commodore Users
Group
P.O. Box 209
Fallston, MD 21047
1st Monday of month
Kim Loyd
(301) 879-3583

Gaithersburg C-64 Users Group
12937 Pickering Dr.
Germantown, MD 20874
3rd Thurs @ G'burg Library
Russel Jarosinski
(301) 428-3328

Jumpers 2064s (Glen Burnie)
7837 B&A Blvd.
Glen Burnie, MD 21061
Jumpers Mall
Walt Marhefka
(301) 768-1892

HUG (Hagerstown Users Group)
23 Conventry Lane
Hagerstown, MD 21740
1st & 3rd Fri. of month
Joseph Rutkowski
(301) 797-9728

Commodore 64 Users Group
11209 Tack House Court
Potomac, MD 20854
Jorge Montalvan
(301) 983-8199

Rockville VIC/64 Users Group
P.O. Box 8805
Rockville, MD 20856
Tom Pounds
(301) 231-7823

The Montgomery Ct. Commodore
Computer Soc.
P.O. Box 6444
Silver Springs, MD 20906
Meryle Pounds
(301) 946-1564

Edison Commodore Users Group
4314 Oxford Dr.
Suitland, MD 20746
Naval Research Laboratory
Bill Foley
(301) 423-7155

MASSACHUSETTS

The Boston Computer Society
Three Center Plaza
Boston, MA 02108
Mary E. McCann
(617) 367-8080

VIC Interface Club
48 Van Cliff Ave.
Brockton, MA 02401
Bernie Robichaud

The Cursor Club
442 Mulpuf Rd.
Lunenburg, MA 01462
John
(617) 582-4056

Eastern Massachusetts VIC Users
Group
7 Flagg Rd.
Marlboro, MA 02173
Frank Ordway

VIC Users Group
c/o Bene Hoffman-Sholar
Needham, MA 02192

Berkshire Home for Little PET
Users
401 Pomeroy Ave.
Pittsfield, MA 01201
Tim Auxier

Berkshire PET Lovers CBM Users
Group
Taconic High
Pittsfield, MA 01201

USER GROUPS

Commodore 64 Users Group of The Berkshires
184 Highland Ave.
Pittsfield, MA 01201
Ed Rucinski

Cape Cod 64 Users Group
358 Forrest Rd.
S. Yarmouth, MA 02664
(In MA. call)1-(800) 352-7787
Jim Close
1-(800) 225-7136

Commodore Users Club
Stoughton High School
Stoughton, MA 02072
Mike Lennon

Masspet Commodore Users Group
P.O. Box 283
Taunton, MA 02780
Harry Flaxman

CUG of MA.
1132 N. Ridge Rd.
Westfield, MA 01085
Paul & Jenny
(413) 568-2228

Pioneer Valley VIC/64 Club
34 Bates St.
Westfield, MA 01085
3rd Thurs. of month
Marvin Yale
(413) 562-1027

EM 20/64 Users Group
36 Buckman St.
Woburn, MA 01801
John Chaplain

Commodore Users Group
c/o Best Business Equipment
269 Lincoln St.
Worcester, MA 01605

MICHIGAN

Ann Arbor Commodore Users Group
Ann Arbor, MI 48103
3rd Tues. 7
Art Shaw
(313) 994-4751

VIC Users Club
University of Michigan
School of Public Health
Ann Arbor, MI 48109
John Gannon

South Computer Club
South Jr. High School
45201 Owen
Belleville, MI 48111
Ronald Ruppert

Commodore Users Group
c/o Family Computer
3947 W. 12 Mile Rd.
Berkley, MI 48072

DEBUG
P.O. Box 196
Berrien Springs, MI 49103
last Thursday of month
Herbert Edward
(616) 471-1882

Mid-Michigan Commodore Club
Clare, MI
3rd Mon. 7pm @ Clare H.S.
Virgil Graham
(517) 386-3429

14361 Warwick St.
Detroit, MI 48223
David Liem

Commodore Users Group
20231 Westmoreland
Detroit, MI 48219
Al Southern II
(313) 535-4549

Michigan's Commodore 64 Users Group (MCUG)
P.O. Box 539
E. Detroit, MI 48021
William G. Osipoff
(313) 773-6302

Michigan's Commodore 64 Users Group
P.O. Box 539
East Detroit, MI 48021
(313) 772-6302

Commodore Users Group
c/o Eaton Rapids Medical Clinic
101 Spicerville Hwy.
Eaton Rapids, MI 48827
Albert Meinke

Edwardsburg Commodore Users Group (ECUG)
c/o Presbyterian Church
124 S. Lake St.
Edwardsburg, MI 49112
3rd Thursday of month
Doug Stringfellow
(616) 663-2792

South East Michigan PET Users Group
Box 214
Farmington, MI 48024
Norm Eisenberg

Jackson Commodore Computer Club
201 S. Grinnell St.
Jackson, MI 49203
last Thur. of month 7
Alfred Bruey

VIC for Business
6027 Orchard Ct.
Lansing, MI 48910
Mike Marotta

Slipped Disk
31044 John R
Madison Heights, MI 48071
(313) 583-9803

SMCUG
1002 Pfau St.
Mankato, MI 56001
Dean Otto
(507) 625-6942

COMP
486 Michigan Ave.
Marysville, MI 48040
M. Gauthier
(313) 364-6804

Commodore Computer Club
4106 Eastman Rd.
Midland, MI 48640
John Walley
(517) 835-5130

SEM 64
25015 Five Mile #3
Redford, MI 48239
Gary Groeller
(313) 537-4163

20050 Winchechester
Southfield, MI 48076
Steve Lepsetz 353-1130 or
(313) 354-7224

VIC
8439 Arlis Rd.
Union Lake, MI 48085
Bert Searing
363-8539

Commodore User Club
32303 Columbus Dr.
Warren, MI 48093
Robert Steinbrecher

DAB Computer Club
P.O. Box 542
Watervliet, MI 49098
Dennis Burlingham
(616) 463-5457

West Michigan Commodores
c/o R. Taber
1952 Cleveland Ave.
Wyoming, MI 49509
Gene Traas
(616) 458-9724

MINNESOTA

MUPET (Minnesota Users of PET)
P.O. Box 179
Annandale, MN 55302
Jon T. Minerich

Brainerd Area Commodore Users Group
1219 S.E. 11th St.
Brainerd, MN 56401
1st Thurs 6pm. & 3rd Sat. 10am
Norm Saavedra
(218) 829-0805

Lake Superior Commodore
1936 Lawn St.
Duluth, MN 55812
Peter Roufs
(218) 728-3224

Heartland Area Computer Cooperative
Route 4
Little Falls, MN 56345
Robert Walz
(612) 632-5511

Twin Cities Commodore Computer Club
6623 Ives Lane
Maple Grove, MN 55369
Rollie Schmidt
(612) 424-2425

Club 64
256 - 16th St.
Owatonna, MN 55060
Stephen Knudsen
(507) 451-0128

MISSISSIPPI

Commodore Computer Club
Southern Station Box 10076
Hattiesburg, MS 38401
Andrew Holder
(601) 268-7585

Commodore Biloxi Users Group
c/o Universal Computer Services
3002 Hwy. 90 East
Ocean Springs, MS 39564
John Lassen
(601) 875-1173

MISSOURI

VIC INFONET
P.O. Box 1069
Branson, MO 65616
Jory Sherman
(417) 334-6099

Mid-Missouri Commodore Club
780 East Park Lane
Columbia, MO 65201
Jim Whitacre
(314) 474-2868

Commodore Users Club of the Ozarks
211 N. Aurora
Eldon, MO 65026
Morris Williams
(314) 392-4248

MOARK Commodore Users Group
P.O. Box 504
Golden, MO 65658
Marshall Turner
(417) 271-3293

Worth County PET Users Group
Grant City, MO
David Hardy
(816) 564-3551

Joplin Commodore Computers Users Group
422 S. Florida Ave.
Joplin, MO 64801
R.D. Connely

KCPUG
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Kansas City, MO 64133
Rick West
(816) 356-2382

Commodore P.A.C.
Horace Mann Room 202
Maryville, MO 64468
Patricia Lucido
(816) 582-4498

Clearwater Club
Clearwater School
Star Route
Piedmont, MO 63957
Carolyn Polk

Commodore Users Group of Springfield
Box 607 HJS
Springfield, MO 65801
Keith Masavage
(417) 831-6403

The Commodore Users Group of St. Louis
Box 6653
St. Louis, MO 63125
Dan Weidman
(314) 968-4409

MONTANA

Powder River Computer Club
Powder River County High School
Broadus, MT 59317
Jim Sampson

Commodore Users Club
1109 West Broadway
Butte, MT 59701
Mike McCarthy

HIGH SCORES

Jump into our on-going competition (for Commodore-manufactured games only). In order to have your high score published, you must send in a photo of the winning screen showing the score. Make sure your name and address are on the back of the photo. If your score is high, we'll run your name and score as soon as we can get it in. Be patient. We work far ahead putting an issue together, so it might take a while for your score to show up. Please note that we've retired several old games, since we stopped getting new scores for them.

VIC 20 Games

CLOWNS
Jon Kirkbride, Jr., Cedars, PA **111,560**

COSMIC CRUNCHER
Kevin Gaines, Bartlesville, OK **998,200**

GORF
Chad McCubbins, Coatesville, IN **998,910**

JUPITER LANDER
Christopher Champlain, St. Petersburg, FL **207,400**

MOLE ATTACK
Ryan Phillips, Montpelier, VT **427**

MONEY WARS
Kevin Thompson, Mishawaka, IN **87,100**

OMEGA RACE
Jim Nelson, S. Elgin, IL **1,502,300 (5 ships)**

RADAR RAT RACE
Allen Barber, Belfast, NY **226,940**

RAID ON FORT KNOX
John H. Kohler, Daly City, CA **15,262**

SEA WOLF
Alicia Kondalski, Toledo, OH **29,500**

Commodore 64 Games

AVENGER
Britt Feldhaus, Edina, MN **67,370**

CLOWNS
Carla Heiland, S. Pasadena, CA **94,180**

JACK ATTACK

KICKMAN
Allen Downey, W. Roxbury, MA **833, 400**

LEMANS
Kim Moser, New York, NY **339,840**

OMEGA RACE
Jonathan Wells, Watertown, CT **692,950 (5 ships)**

SEA WOLF
W. Raymond Feath, Santa Barbara, CA **76,500**

STAR RANGER

STARPOST
Justin Taylan, Hyde Park, NY **999,800**

WIZARD OF WOR
Mark Wells, Bismarck, ND **594,300**

If your score didn't set a record this time, keep playing! Maybe you'll topple these champion gamesters next time!

C

HOW TO ENTER PROGRAMS in *Power/Play*

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN,RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the 'wrong' line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

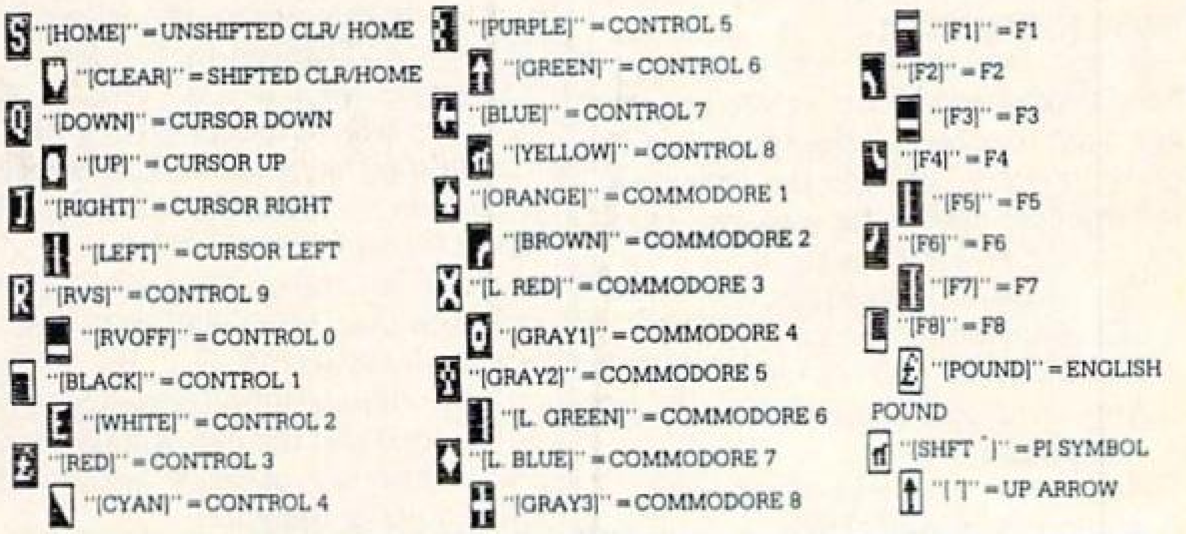
OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when

CHART OF SPECIAL CHARACTER COMMANDS



"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[↑]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is 'running'. Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing

Send your questions to:

Power/Play Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

C

How to Use the Magazine Entry Program

The Magazine Entry Program on page 127 is a machine language program that will assist you in entering the programs in this magazine correctly. It is for use with the Commodore 64 only and was written by Mark Robin using the IEA Editor/Assembler. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49541, and just lets you know that the program is running. If everything is ok, the program will finish running and tell you to type NEW. If there is a problem with the data statements, the program will tell you where to look to find the problem.

Once the program has run, it is in memory ready to go. To activate the program, type SYS49152 and press RETURN. When the READY prompt is displayed, type TEST and press RETURN. You are now ready to enter the programs from the magazine.

Typing the Programs

All the program listings in this magazine that are for the 64 have an apostrophe followed by four letters at the end of the line (i.e., 'ACDF). The apostrophe and letters *should* be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it *does not* enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are six error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

PARENTHESIS: This means that you forgot (or added) a parenthesis somewhere in the line. Check the line in the magazine again and correct the parenthesis.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT..) incorrectly. Check the line in the magazine again and check your spelling.

# OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word mispelled. Check the line in the magazine again and correct the mistake.

C

```
1 PRINT "[CLEAR]POKING-";
5 P=49152 :REM $C000
10 READ A$:IF A$="END"THEN 80
20 L=ASC(MID$(A$,2,1))
30 H=ASC(MID$(A$,1,1))
40 L=L-48:IF L>9 THEN L=L-7
50 H=H-48:IF H>9 THEN H=H-7
60 PRINT"[HOME,RIGHT12]"P;
70 B=H*16+L:POKE P,B:T=T+B:P=P+1
   :GOTO 10
80 IF T<>103233 THEN PRINT"MISTAKE IN
   DATA --> CHECK DATA STATEMENTS":END
90 PRINT"DONE":END
1000 DATA 4C,23,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,00,00,0D
1002 DATA 00,58,C1,5E,C1,66,C1,76
1003 DATA C1,83,C1,8F,C1,EA,EA,EA
1004 DATA 4C,83,C0,A2,05,BD,1D,C0
1005 DATA 95,73,CA,10,F8,60,A0,02
1006 DATA B9,00,02,D9,3C,C1,D0,0B
1007 DATA 88,10,F5,A9,01,8D,10,C0
1008 DATA 4C,1F,C1,60,A0,03,B9,00
1009 DATA 02,D9,38,C1,D0,E0,88,10
1010 DATA F5,A9,00,8D,10,C0,4C,1F
1011 DATA C1,60,A0,03,B9,00,02,D9
1012 DATA 34,C1,D0,E0,88,10,F5,A0
1013 DATA 05,B9,A2,E3,99,73,00,88
1014 DATA 10,F7,A9,00,8D,18,D4,4C
1015 DATA 1F,C1,E6,7A,D0,02,E6,7B
1016 DATA 4C,79,00,A5,9D,F0,F3,A5
1017 DATA 7A,C9,FF,D0,ED,A5,7B,C9
1018 DATA 01,D0,E7,20,5A,C0,AD,00
1019 DATA 02,20,A3,C0,90,DC,A0,00
1020 DATA 4C,EA,C1,C9,30,30,06,C9
1021 DATA 3A,10,02,38,60,18,60,C8
1022 DATA B1,7A,C9,20,D0,03,C8,D0
1023 DATA F7,B1,7A,60,18,C8,B1,7A
1024 DATA F0,35,C9,22,F0,F5,6D,05
1025 DATA C0,8D,05,C0,AD,06,C0,69
1026 DATA 00,8D,06,C0,4C,BD,C0,18
1027 DATA 6D,07,C0,8D,07,C0,90,03
1028 DATA EE,08,C0,EE,0B,C0,60,18
1029 DATA 6D,0A,C0,8D,0A,C0,90,03
1030 DATA EE,09,C0,EE,0C,C0,60,0A
1031 DATA A8,B9,11,C0,85,FB,B9,12
1032 DATA C0,85,FC,A0,00,A9,12,20
1033 DATA D2,FF,B1,FB,F0,06,20,D2
1034 DATA FF,C8,D0,F6,20,54,C3,20
1035 DATA 7E,C3,20,E4,FF,F0,FB,A0
1036 DATA 1B,B9,3F,C1,20,D2,FF,88
1037 DATA 10,F7,68,68,A9,00,8D,00
1038 DATA 02,4C,74,A4,4B,49,4C,4C
1039 DATA 54,45,53,54,41,44,44,91
1040 DATA 91,0D,20,20,20,20,20,20
1041 DATA 20,20,20,20,20,20,20,20
1042 DATA 20,20,20,20,20,20,91,0D
1043 DATA 51,55,4F,54,45,00,4B,45
1044 DATA 59,57,4F,52,44,00,23,20
1045 DATA 4F,46,20,43,48,41,52,41
1046 DATA 43,54,45,52,53,00,55,4E
1047 DATA 49,44,45,4E,54,49,46,49
1048 DATA 45,44,00,4E,4F,20,43,48
1049 DATA 45,43,4B,53,55,4D,00,50
1050 DATA 41,52,45,4E,54,48,45,53
1051 DATA 49,53,00,C8,B1,7A,D0,FB
1052 DATA 84,FD,C0,09,10,03,4C,C7
1053 DATA C1,88,88,88,88,88,B1,7A
1054 DATA C9,27,D0,13,A9,00,91,7A
1055 DATA C8,A2,00,B1,7A,9D,3C,03
1056 DATA C8,E8,E0,04,D0,F5,60,4C
1057 DATA F2,C2,A0,00,B9,00,02,99
1058 DATA 40,03,F0,F2,C8,D0,F5,A0
1059 DATA 00,B9,40,03,F0,E8,99,00
1060 DATA 02,C8,D0,F5,20,D7,C1,4C
1061 DATA 56,C2,A0,0B,A9,00,99,03
1062 DATA C0,8D,3C,03,88,10,F7,A9
1063 DATA 80,85,02,20,1B,C3,A0,00
1064 DATA 20,9B,C1,20,CA,C1,20,31
1065 DATA C2,E6,7A,E6,7B,20,7C,A5
1066 DATA A0,00,20,AF,C0,F0,CD,24
1067 DATA 02,F0,06,20,D7,C0,4C,12
1068 DATA C2,C9,22,D0,06,20,BC,C0
1069 DATA 4C,12,C2,20,E7,C0,4C,12
1070 DATA C2,A0,00,B9,00,02,20,A3
1071 DATA C0,C8,90,0A,18,6D,09,C0
1072 DATA 8D,09,C0,4C,33,C2,88,A2
1073 DATA 00,B9,00,02,9D,00,02,F0
1074 DATA 04,E8,C8,D0,F4,60,18,AD
1075 DATA 0B,C0,69,41,8D,0B,C0,38
1076 DATA AD,0C,C0,E9,19,90,06,8D
1077 DATA 0C,C0,4C,60,C2,AD,0C,C0
1078 DATA 69,41,8D,0C,C0,AD,05,C0
1079 DATA 6D,07,C0,48,AD,06,C0,6D
1080 DATA 08,C0,8D,0E,C0,68,6D,0A
1081 DATA C0,8D,0D,C0,AD,0E,C0,6D
1082 DATA 09,C0,8D,0E,C0,38,E9,19
1083 DATA 90,06,8D,0E,C0,4C,96,C2
1084 DATA AD,0E,C0,69,41,8D,0E,C0
1085 DATA AD,0D,C0,E9,19,90,06,8D
1086 DATA 0D,C0,4C,AB,C2,AD,0D,C0
1087 DATA 69,41,8D,0D,C0,A0,01,AD
1088 DATA 0B,C0,CD,3C,03,D0,20,C8
1089 DATA AD,0C,C0,CD,3D,03,D0,17
1090 DATA C8,AD,0D,C0,CD,3E,03,D0
1091 DATA 0E,AD,0E,C0,CD,3F,03,D0
1092 DATA 06,20,64,C3,4C,7A,C0,AD
1093 DATA 10,C0,D0,11,98,48,68,4C
1094 DATA F7,C0,AD,10,C0,F0,01,60
1095 DATA A9,04,4C,F7,C0,A4,FD,A9
1096 DATA 27,91,7A,A2,00,C8,BD,0B
1097 DATA C0,91,7A,C8,E8,E0,04,D0
1098 DATA F5,A9,00,91,7A,20,64,C3
1099 DATA 4C,7A,C0,A0,00,B9,00,02
1100 DATA F0,11,C9,28,D0,03,EE,03
1101 DATA C0,C9,29,D0,03,EE,04,C0
1102 DATA C8,D0,EA,AD,03,C0,CD,04
1103 DATA C0,D0,01,60,A9,05,4C,F7
1104 DATA C0,A9,20,8D,00,D4,8D,01
1105 DATA D4,A9,09,8D,05,D4,A9,0F
1106 DATA 8D,18,D4,60,20,41,C3,A9
1107 DATA 81,20,77,C3,A9,80,20,77
1108 DATA C3,4C,71,C3,20,41,C3,A9
1109 DATA 11,20,77,C3,A9,10,20,77
1110 DATA C3,A9,00,8D,04,D4,60,8D
1111 DATA 04,D4,A2,70,A0,00,88,D0
1112 DATA FD,CA,D0,FA,60,END
```

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SOLAR FOX

Continued from pg. 91

the reflexes you must depend on.

Playing the regular *Solar Fox* racks at low speed requires an understanding of the points available from each object. After all, with the vortexes zipping all over the grid and thrustors scanning around the border, you must pick and choose a bit. The deadly vortexes can be destroyed with the laser, yielding 300 points. There are plenty of them, but your timing must be good. The red thrustors are worth 100 points (hardly worth bothering with), while the yellow ones are 200 points. There are obstacles called stationary energy fields that look like tiny spirals. They appear with the fuzor rack pattern and will throw your spaceship into a spin if you run into one. You can get rid of them with the laser, receiving 100 points for each energy field.

The real points are available from two objects called a pulzor and a freezor. The pulzor looks like a vibrating star and mysteriously appears and disappears at random spots on the grid. The pulzor score is equally mysterious. You can get up to 800 points and your score appears in the pulzor's place momentarily when you shoot it or run over it. The freezor is worth 800 points, but is very difficult to destroy. It skitters across the grid from out of nowhere, appearing as an insect head. If you manage to destroy one, it will immobilize the thrustors for about six seconds and they will not shoot vortexes at your spaceship for that time. The points available from these objects allow building a high score without even clearing a rack or paying much attention to the fast challenge racks.

But if you are like me, you will trust superior reflexes and fast play to get those gargantuan scores. You thrill in completing high speed corners and clearing the racks in record time. The real challenge will be in accumulating droves of spare spaceships. The absolute ultimate is doing it faster and better than anyone else.

What's that? I think I hear somebody laughing in the next room. I'd better practice up a bit. After all, it takes time to build ultra-fast reflexes and a keen eye. She won't be able to beat me so easily *next* time! **C**

LIFE AFTER GAMES

Continued from pg. 97

volume provides a guide to setting goals and analyzing the performance of various investments. Most interestingly, the program has provisions for "what if" simulations.

Simulations

HES has released two excellent simulations for the 64 called *Project: Space Station* and *Cell Defense*. In *Project: Space Station*, users launch a space station taking into account budget problems, unfavorable media coverage and bad weather. Time pressures overshadow the construction of the space station and when completed, a mission must be chosen from studies on air pollution, astronomy projects, moon base construction, development of computer chip factories in space and a summer camp for kids.

Cell Defense is one of the first interactive human biology computer programs. In this program, users must defend the body against disease and adverse conditions caused by age, stress, drugs and alcohol. Users must make their decisions and draw conclusions as a virus spreads through the human body. The levels of virus difficulty, the disease's rate of reproduction and the speed at which it travels are options.

And, of course, there is SubLogic's (713 Edgebrook Drive, Champaign, IL 61820) well-known *Flight Simulator II*. If you've ever dreamed of flying, jump into this cockpit and take off. Nice graphics and full flight controls lend themselves to a true flight of the imagination. *Solo Flight* for the 64 from MicroProse and *IFR Flight Simulator* for the VIC 20 from Academy Software are two other flight simulators that make excellent gifts.

Interactive Fiction

In interactive fiction, the user controls the course of a story by responding to it in conversational English. There are no graphics, because words create the images. The story can lead in any direction, limited only by your imagination.

In Infocom's (55 Wheeler Street, Cambridge, MA 02138) *The Witness*, a man calls upon your help when he thinks his life is threatened. Of course, there are the usual distractions: the beautiful daughter, a wife dead by suicide, the threatening note. Other interactive fiction by Infocom includes: the *Zork* trilogy, a fantasy series; *Deadline*, a murder mystery; and *Planetfall*, a science fiction comedy.

Spinnaker (1 Kendall Square, Cambridge, MA 02139) has released the *Trillium* series, interactive fiction inspired by the novels of science fiction authors such as Arthur C. Clarke, Robert Heinlein and Michael Crichton. In these, players assume the identity of the characters to embark on adventures. Programs like these certainly offer creativity and intellectual stimulation.

So, as you can see, there really is life after games. Put aside that joystick and embark on a new adventure. Alternatives to games can be just as much fun. **C**

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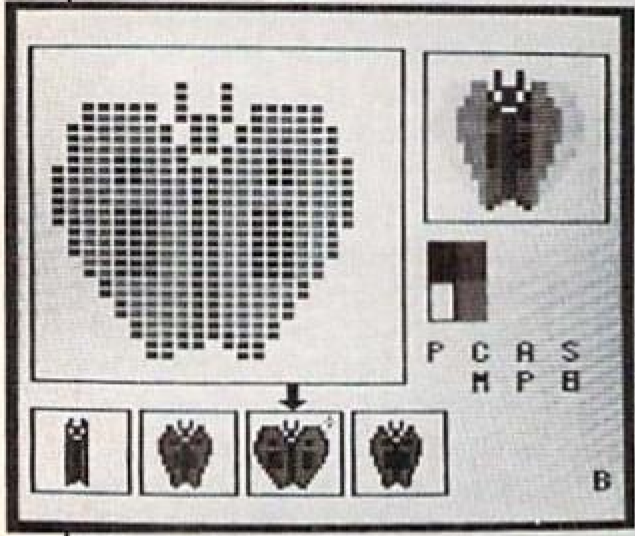
POWER PLAY'S NEWS FROM THE BACK



New Book Explains Sprite Graphics for the 64

Sprite Graphics for the Commodore 64 written by Sally Greenwood Larsen and published by Prentice Hall, is an excellent book for anyone who is interested in using sprites. The book has some of the best explanations of how sprites work that I have seen anywhere and covers almost everything you need to know to use this graphics feature. This is a good book for beginners because you need almost no programming knowledge to use it.

Each chapter covers a different aspect of using the sprites, such as building and moving them. The book explains bit mapping, bit switching and binary notation so anyone can understand them. Included are definitions, simple programs and useful hints. All the programs are easy to read and well explained. The book also includes data for example sprites that you can use in your programs.

One of the best chapters is the one on multicolor sprites. It explains how you give up a little of your resolution to get the multiple colors. The chapter gives excellent examples to illustrate its points and is extremely useful.

As a whole, **Sprite Graphics for the Commodore 64** is a good introduction to sprite graphics. The book shows how you can use sprites in a program and how to incorporate them into games. It is a valuable reference. BY MIKE HINSHAW

Microcomputer Software Numbering System

Dr. Karl W. Neubauer, Director of the International ISBN Agency in West Germany, notified all ISBN Agencies, in 42 countries worldwide, to officially confirm the "inclusion of microcomputer software numbering within the scope of the ISBN System."

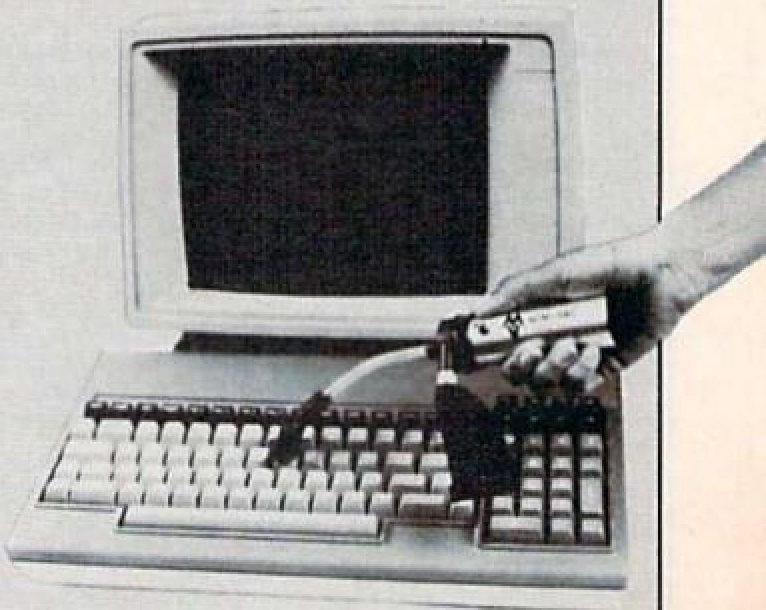
The ISBN is an International Product Identification Code consisting of ten digits. The ISBN system is used for distribution, sales and inventory control, functioning similarly to the UPC system.

More than 5,000 microcomputer software publishers and producers have been assigned ISBN numbers for use on their software products. Computer software producers, such as Ashton-Tate, Dilithium, Scarborough, as well as traditional book publishers such as Prentice-Hall, McGraw-Hill, John Wiley, Random House and Simon & Schuster, are already using ISBN's on software.

Micro-Cleaner

A revolutionary new tool for micro-cleaning, the Mini-Vac is a lightweight, quality-constructed vacuum cleaner that is designed to remove minute particles of dust and debris from hidden and hard to reach areas. Unlike compressed air, which simply disperses the pollutants, Mini-Vac vacuums them away permanently.

Mini-Vac is the tool for all reasons and seasons. It is perfect for computers, camera equipment, typewriters, stereo equipment, arts and crafts, automobiles and home uses. Mini-Vac is equipped with two interchangeable wands, two fine bristle brushes, a cloth vacuum bag and the motor is DC-powered (the 9-volt alkaline battery is not included). Manufactured by The Pine Cone of Gilroy, California, it is compact, portable and versatile, selling at the price of $29.95.



Universal Modem Adapter

The Universal Modem Adapter from Applied Systems and Products of Santa Ana, California, allows a VIC 20 or a Commodore 64 modem to be used with any type of phone. The adapter will support modular as well as nonmodular phones, including one-piece electronic phones with built-in dialing. It does not require modification to your phone and modem and you do not have to purchase additional hardware, such as the RS232 interface and the RS232 acoustic coupler.

POWER PLAY'S NEWS FROM THE BACK

NEWS RELEASE

Commodore's introduction as a book publisher will begin with the Commodore Library, a set of eight books dedicated to BASIC applications on the Commodore 64. These include:

programming for education
on the commodore 64
john oxtven and patrick hall
mathematics on the commodore 64
advanced programming techniques
on the commodore 64
david lawrence
commodore 64 adventures
mike grace
business applications
on the commodore 64
graphic art
on the commodore 64
boris allan
artificial intelligence
on the commodore 64
keith and steven brain

ADVANCED PROGRAMMING TECHNIQUES covers BASIC routines and aids to assist you in writing programs. This becomes a handy reference on debugging, shortcuts, logic, strings, INPUT and GET statements, error trapping, DATA manipulation, and much more.

COMMODORE 64 ADVENTURES teaches the creative process of developing an exciting adventure story complete with sprite graphics and music. A complete listing of the working program is included.

ARTIFICIAL INTELLIGENCE shows how to make your C64 simulate the thinking process of a human brain. Use the techniques to convert your computer into a "thinking" machine.

PROGRAMMING FOR EDUCATION includes numerous practical programs useful in a teaching environment. Topics cover numbers, words, stories, and simulations of ideas through graphics.

MATHEMATICS ON THE COMMODORE 64 covers a wide range of mathematical techniques for your programs, everything from aligning decimals to calculating dates on a Julian calendar. Learn how to use cryptography to create the ultimate secret code.

BUSINESS APPLICATIONS develops useful programs for business applications including accounting, inventory control, word processing, and mailing lists. Also clarifies the concepts of sequential files, fields, and records.

GRAPHIC ART shows you how to create high resolution turtle graphics in BASIC. A handy reference of BASIC routines for your graphics programs.

The Commodore Library books are encased in Commodore blue and identified by the Library logo (an open book).

Mario Eisenbacher, Commodore's book editor reveals that the books are distributed through Ingram Book Company and are available at your local bookstore retailing for $10.95.

commodore 1541
disk companion
secrets of the 1541
disk drive
david lawrence
and mark england

Subsequent to the introduction of the Commodore Library, an eighth book joins the series—The 1541 DISK COMPANION, a complete and easy to read explanation of all the different disk files, directories, error channels, and disk operating system. THE text if you are looking for a comprehensive bible on the 1541 disk drive. Also at $10.95, it is available at your local bookstore.

NEXT MONTH

Watch for These Upcoming Issues

Commodore Microcomputers, January/February: You're not a programmer and you're tired of games. What do you do with your Commodore computer next? Is the new "self-help" software safe for you to use at home? Did you know you can take college courses at home using your computer and modem? Get the full story on all this and much more in the next exciting issue of **Commodore Microcomputers,** featuring Computers in the Home.

Power/Play, February/March: If you ever wanted to know who thinks up those game programs and how they do it, don't miss our Game Programming issue. Get the behind-the-scenes scoop on how Commodore's Bally/Midway arcade conversion, **Solar Fox,** evolved, handy information to help you create your own games and an exclusive interview with the designer of some of the first adventure games, 31 year-old multi-millionaire Scott Adams.

And, as always, you'll find plenty of reviews of the newest in hardware, software and books, programs to type and save, and the latest inside information on what's happening in the world of microcomputers.

WATCH FOR REGULAR COVERAGE OF COMMODORE'S NEW PLUS/4 AND COMMODORE 16 COMPUTERS COMING SOON

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CARDCO "NOW" SOFTWARE

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A fine line of software developed by CARDCO for your Commodore-64 computer with all the features you should expect in much more costly software. CARDCO's "NOW" Series provides many unique and exclusive features and are packaged for easy reference, simple storage, instant recognition.

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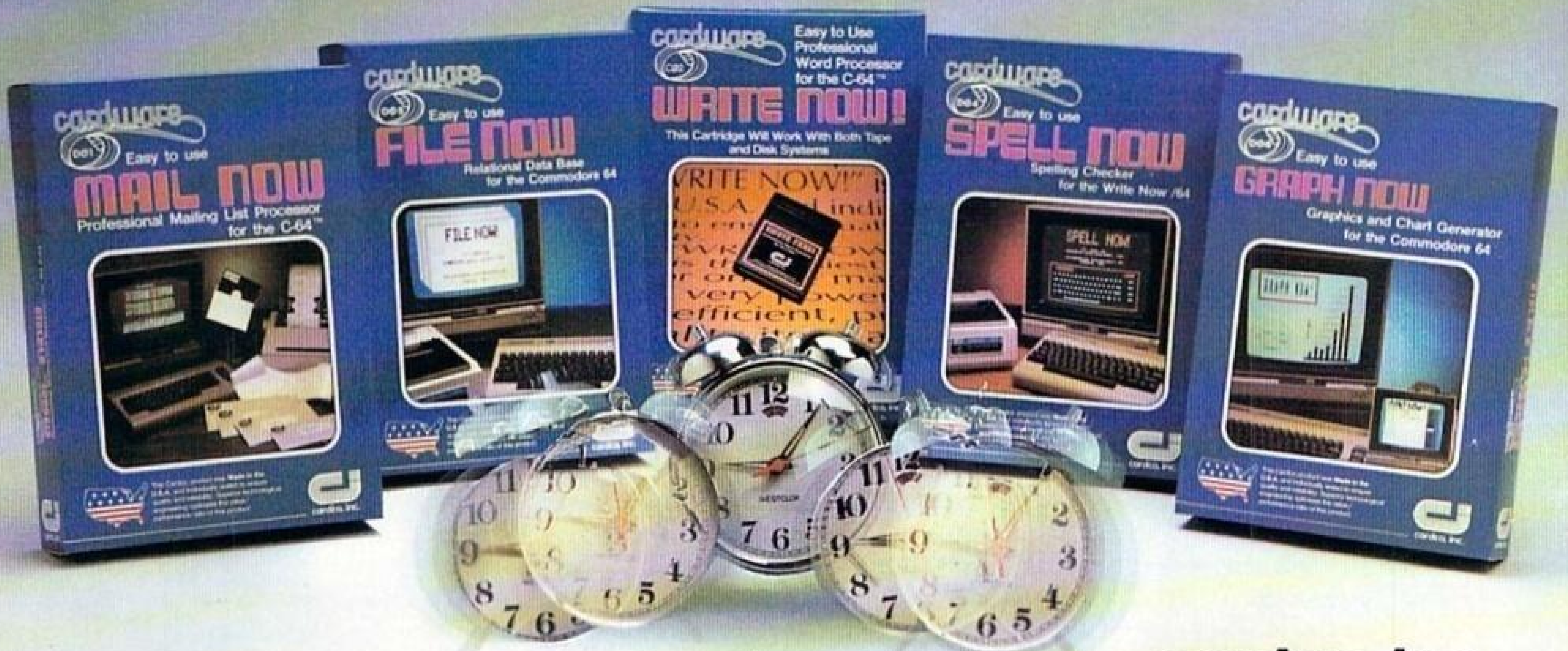
"MAIL NOW" . . . MAILING LIST SOFTWARE . . . CARDCO's D/ 01 "Mail Now" quickly (in memory) sorts by zip, category, name and state; fully compatible with "Write Now". Other fine features include: user-oriented; menu-driven operation; each disk supports 600 entries. Format can print single, double or triple labels across.

"SPELL NOW" . . . Cardware D/ 04 . . . a fine program designed as a spell checker for use with "Write Now" on the Commodore-64. A 34,000 word dictionary with two additional user constructed dictionaries. Menu-driven operation for ease of use. And "Spell Now" allows you to see each misspelled word in the context of your document for correction.

"FILE NOW" . . . D/ 05 . . . is a totally integrated, menu-driven database software package which interfaces with both the "Write Now!" for the 64 and the "Spell Now." 40K of working storage space is available with "File Now". "File Now" appears on the screen as index cards for easier manipulation of your data base; you see 5 index cards at a time. Cards are user defineable, i.e., user determines what goes where on the "index cards" and can sort by any given field. Every card has a general topic field which allows for quick sorting through cards.

"GRAPH NOW" INCLUDING . . . "PAINT NOW" . . . D/ 06 . . . This disk-based graphic/logo generator is totally menu-driven. Allows for the development of pies, charts, bar graphs and other vivid graphic illustrations. Also has the ability to design, and print logos and high resolution pictures. "Commodore-ready"; interfaces with CARDCO'S "Write Now" Word Processor, "Mail Now", "Spell Now" and "File Now".

Write for illustrated literature and prices or see CARDCO Computer Accessories and Software wherever Computers are sold.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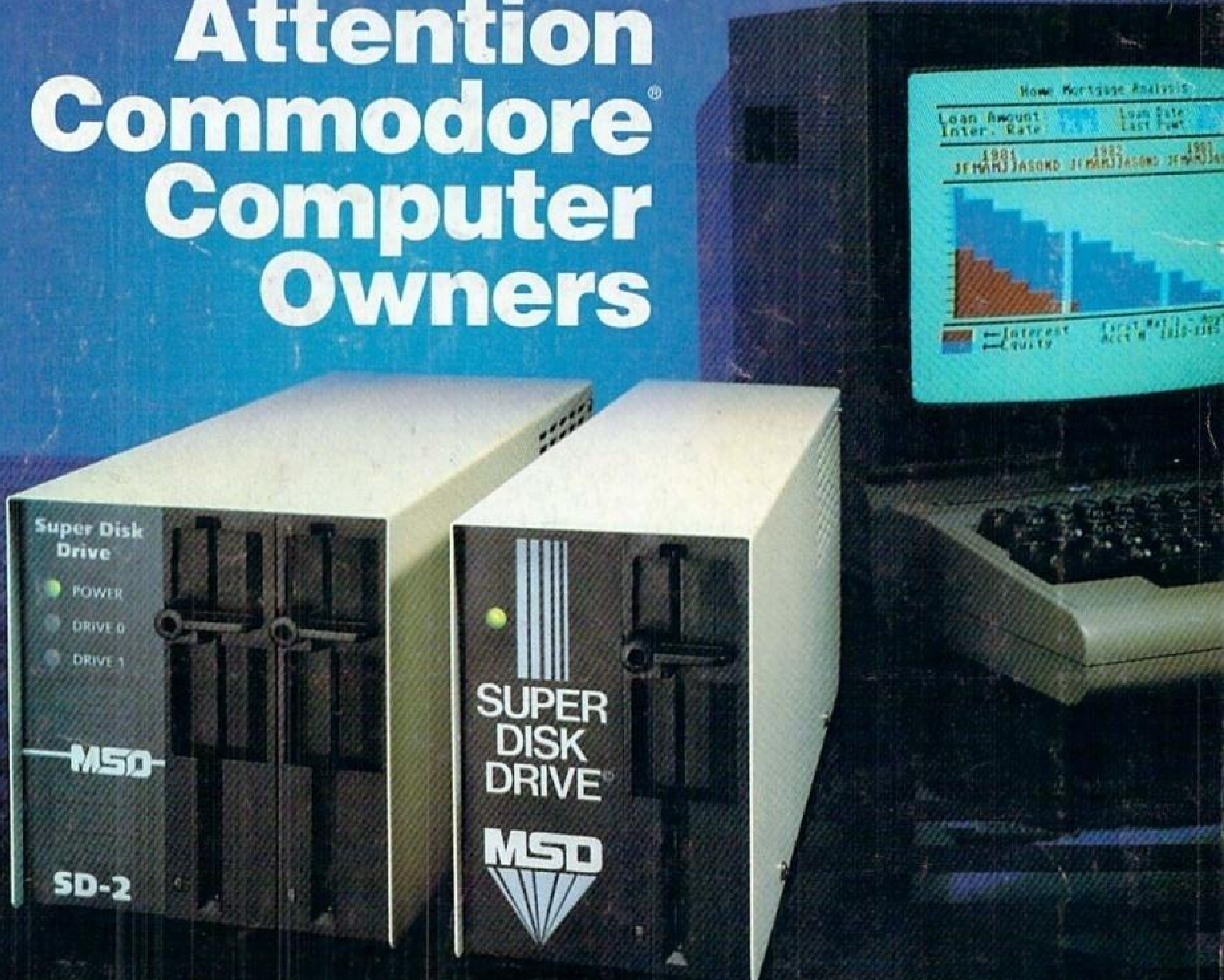
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